

FLIGHT

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Editor
C. M. POULSEN

Managing Editor
G. GEOFFREY SMITH

Chief Photographer
JOHN YOXALL

Editorial, Advertising and Publishing Offices: DORSET HOUSE, STAMFORD STREET, LONDON, S.E.1

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Telephone: Ho 3333 (50 lines)

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Third-party Insurance

COMPULSORY insurance against third-party risks has been in force for some time on the roads, and it is now to be applied to aircraft. A résumé of the Bill which is to be introduced will be found on page 540. The step is in accordance with the recommendations of the Gorell Committee, and the only surprising thing about it is that the rule was not enforced earlier.

It is certainly to be welcomed. It protects against loss the person whose chimney-pots may be removed by a sudden unwelcome visitor from the skies, and it also protects the aircraft owner by limiting the amount of his legal liabilities. The only person likely to object to the innovation is the sort of owner who prefers to keep the premiums in his pocket, the sort of man who piously hopes that he will never do damage to a third party, and, if left to himself, would just "chance it." No sympathy at all need be wasted on people of that frame of mind. Everybody needs protection from them, and they need protection from themselves. The proposed Act will provide both.

Limited Liability

The main reasons for enforcing this third-party insurance became generally familiar when the rule was applied to owners of cars. An owner of a car or an aeroplane may do damage to person or property for which he simply has not got the money to pay compensation, and, though the aggrieved party may get legal damages assigned by a court, in practice he gets nothing, and has to bear the loss himself. When the owner is obliged to insure, then the third party gets compensation from the insurance company.

The owner is also protected by this compulsion, because his liability is limited to the amount named in the insurance policy. The aggrieved party is at liberty to insure himself against any greater amount of loss, and such policies are commonly taken out. Naturally, the premiums demanded for such a policy will be smaller

when there is a certainty of getting a substantial amount out of the owner of the offending car or aeroplane. All parties are gainers by this compulsory insurance.

The amounts for which the owners of power aircraft are obliged to insure are on the high side. The minimum is £5,000. The premiums, however, should be low, as third-party damage by aircraft has not hitherto been on a lavish scale. The commonest case is a forced landing in a crop, and then less damage is usually done by the actual landing than by the crowd which tramps across the field to see the spectacle.

There is to be an alternative to insuring with an approved insurance company. The aircraft owner may cover his liability by depositing with the Accountant General of the Supreme Court a sum to cover his maximum liability for one accident. Ordinarily this would only be worth while if the interest on that sum were less than the amount of the premium, which is a very unlikely case. But in the case of an owner operating a number of aircraft, it is proposed that the security deposit need only be the maximum to cover his two largest machines. That will confer a distinct boon on transport companies who have a considerable number of machines in service, and who will be able to cover the risks of them all by making deposits for the two largest.

There is one innovation proposed in the Bill which cannot be welcomed. There is to be a new document, an official licence to fly, which will be issued on production of the certificate of insurance or deposit. In the case of cars the insurance company gives the owner a certificate of insurance, and that must be produced within five days when demanded by the police. Surely a similar procedure should be good enough in the case of aircraft. The official licence to fly can only say what the certificate of insurance or of deposit already says, that the law about third-party insurance has been obeyed. The multiplication of official documents is to be deplored, and ought to be restrained, except in cases where a very good reason can be made out for enforcing their use. If there is a good reason for insisting on this licence to fly, it is not obvious, and so far it has not been officially explained.

This Freedom

H OPE of finding Sir Charles Kingsford Smith and his companion alive has now to be reluctantly abandoned. The loss of this great pilot is a heavy blow to the whole Empire, and naturally Australia in particular is stricken with grief. It all seems so needless, for the tragedy could have been averted if Kingsford Smith had stuck to his earlier principles of never taking risks in a single-engined machine on long sea crossings. He was once the protagonist of caution, the man who showed that crossing the Pacific or the Tasman Sea could be made safe and almost easy. That he of all men should have ventured out over the Bay of Bengal in a single-engined machine is a tragedy.

One reaction to this tragedy is that the Australian Minister of Defence, Mr. Parkhill, has announced his intention of placing before the Commonwealth Parliament measures for the prohibition of record-breaking flights of this kind. It is impossible to refuse sympathy to this desire to prevent further sacrifices of valuable lives for an object which in calm judgment must be counted unworthy—though there are some records which are worth while, worth even the risk of human life. The record between England and Australia by small machines now stands low enough, and the matter should be left at that. The business of the future is to fly commercial machines in regular operation between the two countries in the shortest time that is justified by the needs of the business community.

The provisions of the measures which Mr. Parkhill

has in mind are not yet known, but it is very much to be doubted if any effectual Government action is possible. Governments can, and do, restrain the taking of risks by commercial aircraft, and it is quite right that they should do so. But it is not practicable to prevent a private person from trying for a record when the flight carries him over several countries. Britain cannot prevent him from starting, provided that he has a certificate of airworthiness and does not exceed the load which it permits. Australia cannot prevent him from arriving and landing. It would be beyond the skill of the League of Nations to persuade all intermediate countries to place restraint upon his actions.

Even if it were possible to prevent a pilot from attempting a risky flight in the hope of breaking a record, it would not be advisable for the Governments of the world to take such action. No one would wish to see a version of A.N.D. 11 applied to the whole world. It would not be good policy to deny to the individual the right to risk his own life, provided that in doing so he did not endanger the welfare of the community. No one has ever suggested legislation to prevent mountaineering, though all the world deplored the loss of Leigh Mallory and Irvine in the attempt to conquer Everest. *Flight* has always maintained that the risks taken in the Schneider contests were worth while, sad though the tragedies of Brinton and others certainly were. The world would be the poorer if youth, and particularly British youth, were to lose its love of adventure, even though adventure usually means risk, and risk must sometimes mean loss. The only remedy seems to be the cultivation of a healthy public opinion.



... PHILADELPHIA IN THE MORNING. This is the latest type of Autogiro to be delivered to the U.S. Army Air Corps. It is a product of the Pitcairn factory and has a Wright Whirlwind engine of 420 h.p., which is reported to give a maximum speed approaching 150 m.p.h. Here the machine is seen on a test flight prior to delivery at Wright Field, Dayton, Ohio, for official tests.

The Outlook

A Running Commentary on Air Topics

Active Co-operation

THINGS are certainly moving in the matter of the projected Atlantic service. Last week, as recorded elsewhere, representatives of the Air Ministry, of the General Post Office, and of Imperial Airways left for Ottawa in order to discuss the problems of such a service with the Canadian authorities.

More interesting still is the fact that representatives from the Irish Free State and from Newfoundland will take part in those discussions, so that nobody will be able to say, when the experimental service is started, that he has not been consulted in good time. As Sir Eric Geddes remarked in his speech at the general meeting of Imperial Airways, the number of political complications incidental to the planning of such an ambitious service would surprise the inexperienced.

An American Bid

THE diplomats are busy, so it is reported, over the desire of Pan-American Airways to run an air service across the Pacific to New Zealand. The American firm wishes to use some British islands on the way as fuelling bases, and is reported to be willing to grant reciprocal rights to British operating companies to use American islands in the Pacific. The latter concession is subject to sanction by the United States Government.

Of one thing everybody may be quite certain. The New Zealand Government is not in the least likely to make any concession which would possibly sacrifice or even jeopardise any rights or prospects of a British firm in the future. New Zealanders often do travel to Britain across the Pacific and through the Panama Canal, and so a Pacific airway would be a great convenience to them, whether it were American or British. But it would be contrary to all history for New Zealand to snatch at an immediate advantage for herself if by so doing she compromised wider British interests. There is no part of the Empire more Imperially-minded than the island Dominion in the South, which is often described as a beautiful counterpart of Great Britain.

A Fine Opportunity

HITHERTO the great French speed race for the Coupe Deutsch de la Meurthe, although nominally an international event, has not attracted foreign competitors, and this year it became entirely a one-firm affair. Evidently realising the disadvantages of this, the French Aero Club has, in collaboration with the French Air Ministry, taken steps to give greater encouragement to foreign competitors. Not only are they, in next year's event, to be eligible for the large prize of 100,000 francs, but the French Air Ministry is offering to buy the winning aeroplane for 900,000 francs, so that the winner may actually "lift" a cool million francs for his firm, not to mention the prestige of holding the Deutsch Cup for a year.

That should make it decidedly worth while to enter British machines. As in previous years, the only limitation imposed upon competitors is that the engine capacity must not exceed eight litres, and this may prove something of a drawback in that there is no British engine of just under that capacity and fitted with a supercharger. The French engine constructors, on the other hand, have been getting 350 h.p. and more out of their eight litres, a power

output which resulted in the race being won this year at an average speed of nearly 276 m.p.h.

With a possibility of "collecting" a million francs (approximately £13,340 at the present rate of exchange) there is very good inducement to build machines specially for the race, and to modify and redesign engines to come within the eight-litre class. As the race is not to be held next year until September 13, there is time to make the necessary preparations. It is to be hoped that several British challengers will dispute France's claim to having the fastest single-seaters of this engine capacity.

Air Power in Africa

MARSHAL of the Royal Air Force Sir John Salmond, in a recent newspaper article, has pointed out that if Italy were to establish herself in Abyssinia it would be necessary for Britain to make a large increase of her air establishments in all African countries which march with that Empire. Aden, British Somaliland, Kenya, Uganda, and the Sudan would all be affected. Such an increase is not provided for by the present expansion programme, which is almost entirely concerned with the home defence air force. It is a prospect which it is not at all pleasant to contemplate, especially as the present expansion of the home defence force is only providing a minimum of what is necessary.

When it is completed it will in all probability have to be regarded as the basis from which to proceed to a state of preparedness more in proportion to our needs and to the advances made in the meantime by other Powers. From any future Disarmament Conference, so long as it talks about disarmament, we look for no relief. Limitation of armaments might be a more hopeful subject of discussion. Fortunately the League of Nations has now shown itself an active force for good, and there is a lively hope that its sanctions will stop the present war, and make it clear for the future that wars of aggression are not a profitable undertaking.

In the meantime we may congratulate ourselves that for the next four years we have a Government which will face realities, and will not shrink from arming where arms are necessary.

Oil Supplies in War

"PETROL is the lifeblood of a modern army, and not an aeroplane, a tank or a lorry could move without it," writes Maj. Gen. A. C. Temperley, military correspondent of the *Daily Telegraph*, in a discussion on Sanctions. Col. Bristow laboured the same point in his paper before the Royal United Services Institution last Wednesday, and spent much time in stressing the vulnerability of our lines of oil supply. The remedy which he suggested was a twenty-million-pound scheme of storing oil underground, for he admitted that oil from British coal was not likely to provide a substantial proportion of our needs.

Naval officers who took part in the discussion seemed to think that the Navy was capable of protecting our supplies of oil just as well as it could protect our supplies of food. It is to be hoped that they are right, for if either supply fails in time of war, then we are defeated. The Naval officers made a good point by pointing out that the change from coal to oil had not affected the situation quite so much as Col. Bristow had suggested. In the days of coal we produced our fuel in Great Britain, but we did not keep it

all there. Our overseas coaling stations had to be kept full. Likewise oil fuel does not all need to be brought into Great Britain. Stocks are needed at Singapore, Aden, and elsewhere, and consequently the 955 million gallons which we receive annually from Rumania, Russia, and Asia need not all run the gauntlet of hostile forces in the Mediterranean. And, after all, if we are ever again involved in war there is no necessity to assume that the Mediterranean will be full of hostile forces.

A Service Innovation

APPARENTLY it came as something of a surprise to a number of readers to see the Vickers Wellesley single-engined monoplane, which was produced as a private venture to a recent Air Ministry specification for general-purpose machines, classed in a recent issue of *Flight* as a medium bomber. This is, however, quite understandable, for, up to the present, the only medium bombers in the Service have been twin-engined machines—Sidestrands and Overstrands, of Boulton Paul manufacture. The explanation of the classification of the new Vickers with such types is as follows:—

There are no squadrons in the R.A.F. designated "general purpose," but there are, of course, a very large number armed with what are known as general-purpose aeroplanes. These machines, on entering service, are usually allotted to a bomber squadron, although, in certain cases, they have been delivered to army co-operation units. When employed purely as bombers, these G.P. machines, up to the present, have been grouped in the light bomber category, which means that they carry about 500 lb. of bombs for a comparatively short range. Actually, certain types in use will carry 1,000 lb. of bombs, but this is abnormal.

The general-purpose aircraft built to the last Air Ministry specification for G.P. machines were able to carry a considerably greater load than the types they were designed to replace, and, in the majority of cases, a torpedo could be carried as an alternative to the bomb load. A private venture monoplane submitted by Vickers was ordered as a result of this competition and named the Wellesley.

It is a monoplane with a wing of exceedingly high aspect ratio, and, owing to the fact that its structure is designed on the Wallis "geodetic" principle, it is able to lift a very much greater load than the familiar general-purpose types produced a few years back and to carry it for a longer distance. This means that the machine is superior to the light bomber on both these scores, and it has been classed, in consequence, as a medium bomber.

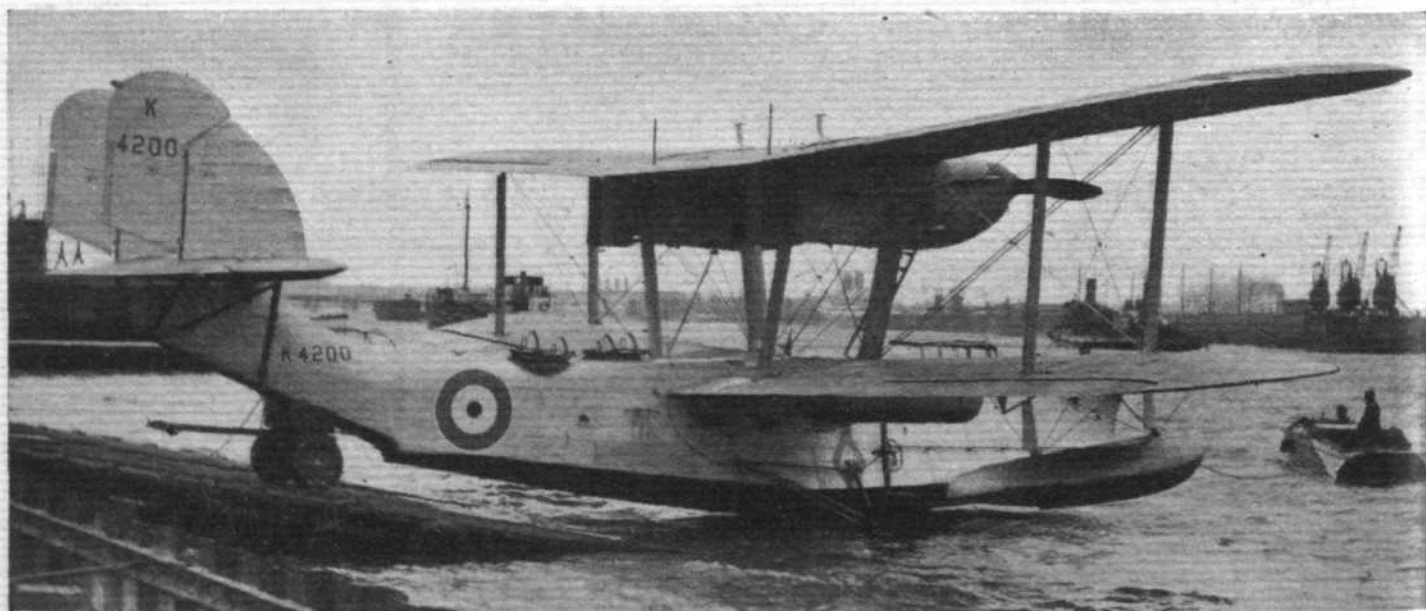
France also has been interesting herself in the heavy single-engined bomber monoplane, extreme range, apparently, being the attraction. The new Vickers machine, as may be seen from the photograph on page 537 of this issue, has the lines of a long-distance record breaker, and great things are expected of it. It is known that its gross weight is 10,000 lb., and it may be safely assumed that something like half this may represent disposable load. The prototype was fitted with the 690/750 h.p. Bristol Pegasus radial, but the production Wellesleys will have the Pegasus XVIII, permitting, no doubt, an increased performance. Modern aids to efficiency, including flaps, a retractable undercarriage and possibly a c.p. airscrew will be fitted.

Free Cooling

FOR very many years the air-cooled aero engine, and more particularly the air-cooled radial, had a hard fight for existence in competition with the liquid-cooled engine. Its large frontal area was often cited against it, and the view was freely expressed that, even if the air-cooled should be found to serve reasonably well on slow aircraft, it would never be of any use on really fast machines.

That view received a severe blow last Monday evening at the Institute of Electrical Engineers, when Dr. Douglas told members of the Royal Aeronautical Society something of the results of cooling experiments carried out in the new 24 ft. wind tunnel at the Royal Aircraft Establishment. Tests on a Gloster Gauntlet with Mercury engine showed that the total cooling drag was about 10 per cent. of the engine power, but this was with fixed cowl and no baffles. By fitting flaps to control the exit of the air from the engine cowl it was estimated that this cost of cooling could be reduced to something like 1 per cent. of the engine power. A similar result was actually obtained in tests on a Rapier installed in a Bulldog, when entry fairings were fitted to the cowl and controllable exit-flaps set to give just sufficient cooling and no more at top speed.

Dr. Douglas went even further. He pointed out that, by recovering energy from the heat added to the cooling flow in very fast aircraft, say, of 300 m.p.h. and upwards, cooling could probably be made to add to the propulsive instead of to the drag force! A brief summary of Dr. Douglas' lecture is published on page 524 of this issue, and a more detailed *résumé* will be published in *The Aircraft Engineer* (monthly technical supplement to *Flight*) next week.

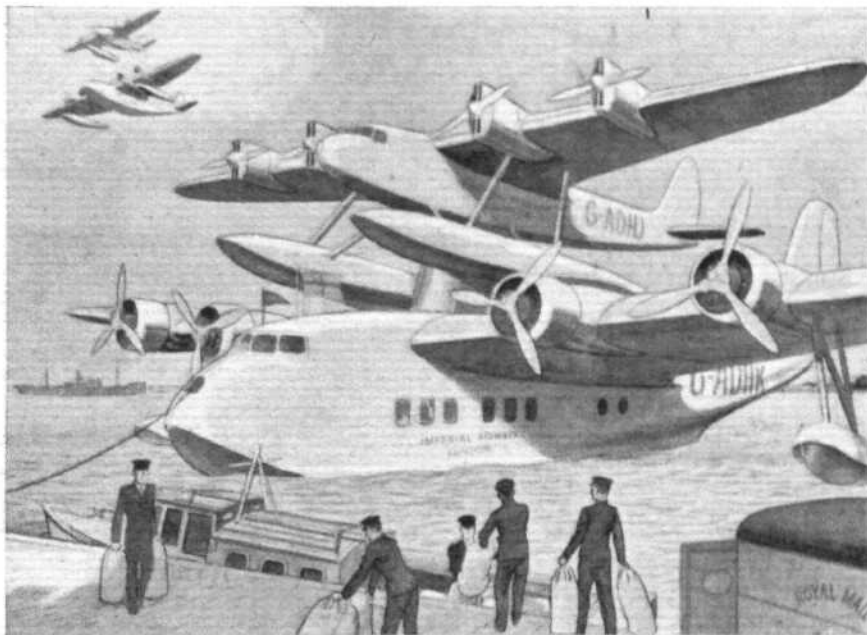


ACCEPTANCE TRIAL: One of the production-type Supermarine Scapa flying boats (two 525 h.p. Rolls-Royce Kestrel III engines) being launched for a test flight prior to delivery. The Scapa is the latest type of flying boat to go into service with the R.A.F. (*Flight* photograph.)

IMPERIAL AIRWAYS' NEW FLEET

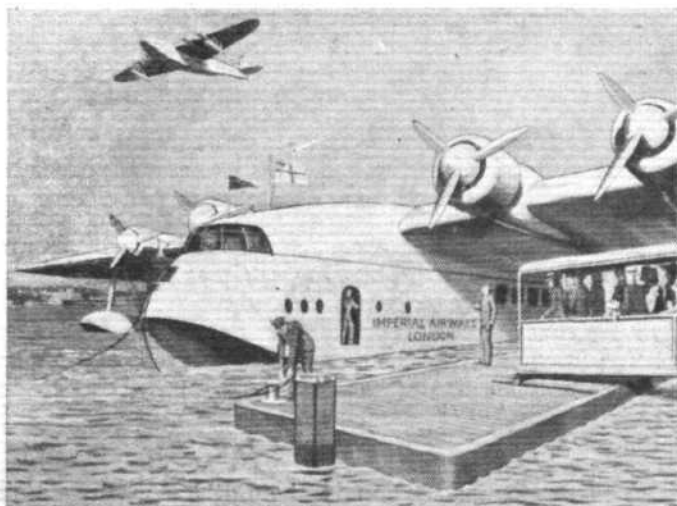
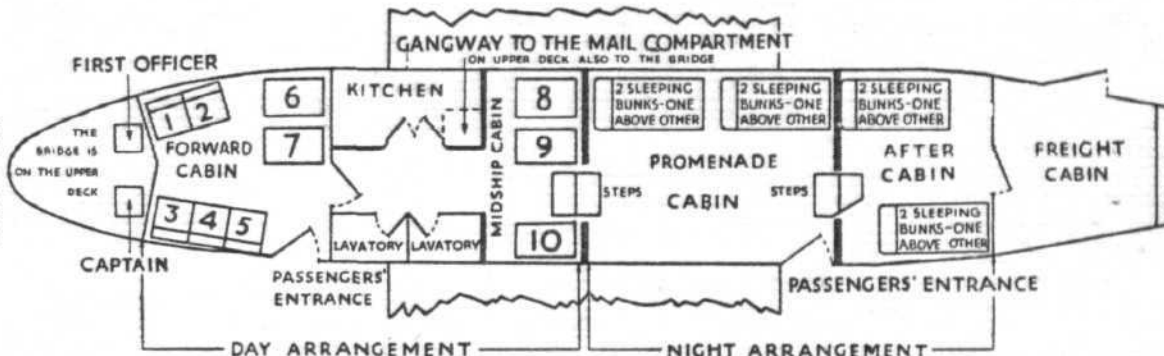
A Pictorial Forecast

IT has now become possible to give some idea of how the three new main types of aircraft ordered by Imperial Airways will appear when they are finished. The illustrations are artist's impressions, taken from the company's report of the annual general meeting, and one should not, perhaps, expect photographic accuracy from them. The three types ordered are as follows: The so-called "Empire" flying boat (Short), the Short-Mayo "composite" aircraft, and the Armstrong-Whitworth four-engined monoplane. The principles of operation of the "composite" aircraft were described in *Flight* of November 7 and 14, 1935.

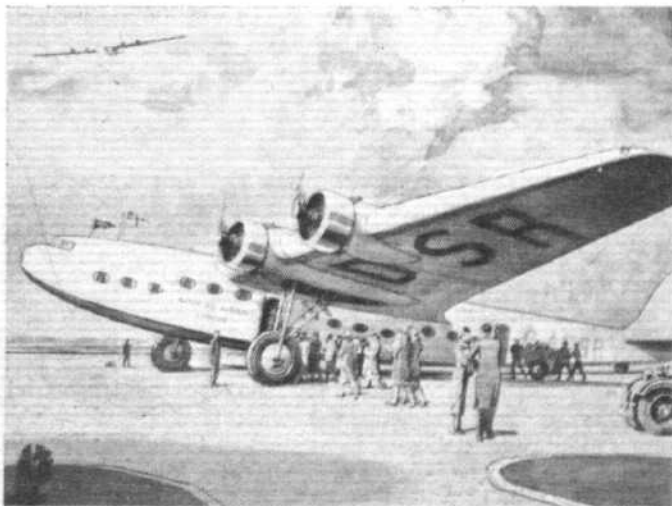


The Short-Mayo "composite" aircraft consists of a large lightly loaded flying boat which carries the long-range seaplane to the operational height and then releases it.

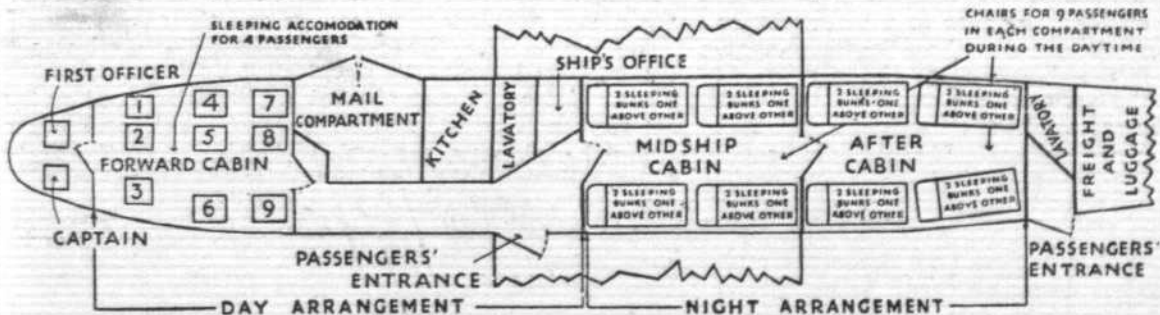
Plan of the accommodation of the "Empire" boat, which will carry 24 passengers in the daytime and 16 at night.



The Short "Empire" flying boat will have a flat-sided hull and four Bristol engines in the leading edge of the wing. Its passenger accommodation is shown above.



Four Armstrong Siddeley "Tiger" engines will form the power plant for the new Armstrong-Whitworth monoplane, the accommodation of which is shown below.



Daytime accommodation for 27 passengers will be provided in the Armstrong-Whitworth monoplane, and sleeping accommodation for 20.

REDUCING COOLING DRAG

Importance of Controlling Air Exit : Radial and "H" Engines : Cooling Loss Reduced to 1 per cent. : Some Interesting Points from an R.Ae.S. Paper by Dr. G. P. Douglas

THAT great reductions are possible in the drag which arises from cooling an aero engine was indicated by Dr. G. P. Douglas, M.C., D.Sc., A.F.R.Ae.S., in the paper presented before the Royal Aeronautical Society last Monday. The paper naturally divided itself into two parts, of which the first dealt with the new 24 ft. wind tunnel, sometimes called the "full-size" tunnel, at the Royal Aircraft Establishment at Farnborough, and the second with results of full-scale tests made in that tunnel.

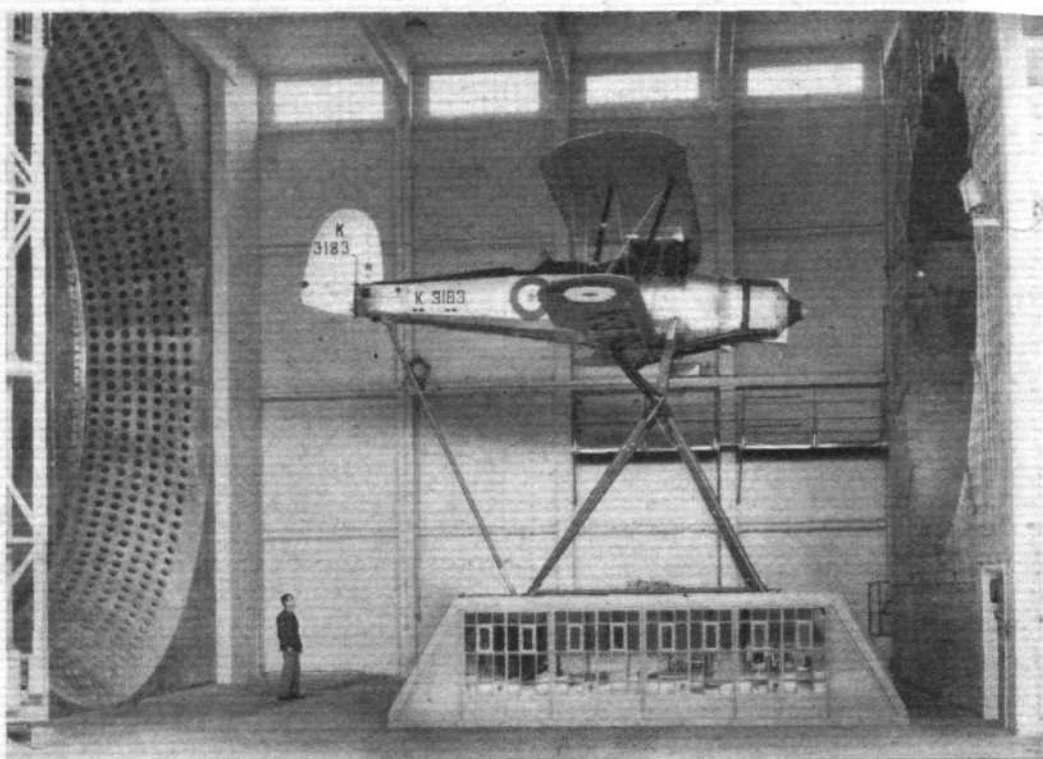
The 24 ft. wind tunnel was officially opened by Lord Londonderry last April (see *Flight* of April 11, 1935), when the Secretary of State for Air, as he then was, referred to it as the "Temple of the Winds." Dr. Douglas recalled that a scale model of the 24 ft. tunnel, with a working section one foot in diameter, was first built and experimented with until the flow was satisfactory. Afterwards this 1 ft. tunnel proved very useful for ice-formation experiments. Another tunnel with 5 ft. working section was built next. When fitted with a 500 h.p. motor it proved a very useful tunnel, in which speeds up to 215 m.p.h. could be obtained. Finally, the 24 ft. tunnel was built, and when troubles with pulsation had been cured by fitting "tabs" in the mouth of the nozzle, the tunnel was ready for tests.

There was some doubt concerning the effect of testing in the tunnel a full-size aircraft of which but the central 20 ft. or so were in the air jet. A Bristol fighter model of 8 ft. span was tested in the 5 ft. tunnel and in the N.P.L. Duplex tunnel, and it was found that the effective thrust of the airscrew deduced from measurements in the open jet was in complete agreement with that from the Duplex tunnel.

Cooling Problems

The lecturer pointed out, by way of showing the importance of reducing engine drag, that in a recent design of commercial aeroplane suitable for the Atlantic passage, fitted with four 600 h.p. radial engines, if the drag per engine was taken at the very modest figure of 15 lb. at 100 ft./sec., one of the engines merely served to neutralise the drag of the other three engines. If engine drag could not be reduced below 15 lb. at 100 ft./sec., it was found that at 380 m.p.h. the whole thrust would be required to overcome engine drag.

The net power required to cool an engine at low speeds was the product of the air flow through the cooling system



In the 24ft. wind tunnel at Farnborough : A Bristol Bulldog with Napier Rapier engine on the balance. — Control of the exit of the cooling air reduced the cost of cooling to 1 per cent. of the power of the engine. (R.A.F. Official Photograph, Crown Copyright.)

and the pressure drop. For liquid-cooled engines this power could be reduced indefinitely by making the radiator large enough. With a reasonable size radiator the loss would be between 1 and 2 per cent. of the horse-power. For an air-cooled engine the loss would probably be about 2 or 3 per cent. If these low-percentage cooling losses were to be maintained at high speeds, they must have an efficient duct system in which the speed of the cooling air was reduced to that required for efficient cooling.

Full-scale Tests

Tests were made in the 24 ft. wind tunnel on a Gloster Gauntlet biplane fitted with Bristol Mercury VI.S. engine and a Bristol Bulldog with Napier Rapier. The engine of the Gauntlet had a fixed cowl, and was without baffles. At conditions corresponding to level flight at 230 m.p.h. and 15,000 ft., the total cooling drag was approximately 10 per cent. of the engine power. The Gauntlet's engine being adequately cooled during climb, the flow in level flight must be greater than required, and it was thought that, by suitably throttling the air stream where it emerged from the trailing edge of the cowl, the efficiency could be considerably increased.

The Rapier installation in the Bulldog was completely baffled. The engine was adequately cooled on the climb at 95 m.p.h. The cooling drag at level flight attitude was 6.2 per cent. of the b.h.p. at a top speed of 150 m.p.h. The flow through the cowl was 28 per cent. in excess of the actual quantity necessary to cool the engine.

Passing to controlled cowling tests, the cowl was redesigned by incorporating controlled exits and by adding fairing pieces to the cowl entries. With the cowling flaps set to give adequate cooling in level flight, cooling drag was reduced to 1.5 per cent. of the b.h.p. of the engine. It was thought that without introducing baffles in the Gauntlet installation, but by controlling the exit, a reduction in cooling drag of about 9 per cent. could be obtained. It was important that the cooling air should have an easy passage to the outside air stream.

A GREAT PILOT PASSES

Aviation and the British Empire Suffer a Grievous Loss by the Death, Which Must Now be Presumed, of Sir Charles Kingsford Smith, M.C., A.F.C.

"KINGSFORD SMITH I regard as the greatest flier in the world to-day." So wrote Mr. Anthony Fokker in his book, "Flying Dutchman," and he is no mean judge.

That is a fitting epitaph for the great Australian pilot. Since he disappeared on November 7 most careful search has been made for him in the Bay of Bengal by R.A.F. flying boats and landplanes, but it has now been abandoned.

It would have been surprising if such a brave man had not won the Military Cross in the war, but it is as the greatest of long-distance pilots that his name will live. After the war he was seized with a desire to fly the Pacific, but he had to wait eight years. He put in several of those years as chief pilot of Major Brearley's West Australian Airways, and then left to set up business in partnership with Charles Ulm. In 1927 they bought one of the old Bristol Tourers (Puma engine) with which Brearley had started his service, and in it flew round Australia in ten days, when the previous time for the circuit had been twenty-two days.

Then Mr. Lang, Premier of New South Wales, promised them State help for their Pacific adventure, and they went off to America. They bought a Fokker without engines from Sir Hubert Wilkins, and named it *Southern Cross*. After many financial troubles a rich American came to their rescue, and they were able to install three Wright Whirlwinds. Kingsford Smith trained himself sedulously in instrument flying, and they engaged a wireless operator and a navigator. On May 31, 1928, the *Southern Cross* and its crew of four set out from Oakland, near San Francisco, and made Honolulu in its first hop, Fiji in its second, and Australia (110 miles south of Brisbane) in its third. The three engines, the wireless, the navigator, and Kingsford Smith's piloting made the flight seem almost easy. Kingsford Smith frequently insisted that for long sea crossings three engines and good radio were essential, but in later years he did not live up to his earlier principles.

The Australian Government made Ulm an Hon. Flight Lieutenant in the Royal Australian Air Force, and Kingsford Smith an Hon. Wing Commander. Afterwards he was promoted to Hon. Air Commodore.

In the same year the *Southern Cross* flew the Tasman Sea to New Zealand and back.

Round the World

In 1929 Kingsford Smith and Ulm with a new crew flew the *Southern Cross* to England in record time. The machine was then overhauled at Fokker's works in Holland, and Kingsford Smith with a new crew flew it on to America and across to San Francisco, thus completing the circuit of the world.

Ulm and Kingsford Smith had decided to form a flying company in Australia, which they called Australian National Airways, and they bought four Avro 10 machines. With these they opened an unsubsidised service between Brisbane and Sydney, which at first was very successful. Afterwards they extended the route to Melbourne and Tasmania, and then financial difficulties met them. The un-



"Smithy"—a very typical picture.

fortunate loss of one Avro 10, which disappeared completely and was never found, damaged their credit further, and the company had to be wound up.

On October 9, 1930, Kingsford Smith left Heston in an Avian, determined to beat Hinkler's record for a solo flight to Australia. He did this with plenty to spare, taking only 9 days 21 hours. On December 10 of the same year he married Miss Mary Powell, and declared that he would thenceforth live a quiet life.

This promise proved more than he was able to keep, and on September 24, 1931, he left Wyndham in an Avian trying to beat Mollison's time to England. He seemed likely

to do it, but sunstroke afflicted him, and when he reached Athens he had to admit himself a sick man. He had barely recovered when in December, 1931, he flew the Christmas mail to England in one of his old Avro 10 machines, the *Southern Star*, and in January, 1932, took English mail out to Australia. In the Birthday Honours of that year he was made a Knight Bachelor, and in the December a son was born to him and Lady Kingsford Smith.

In 1933 he made a second return crossing of the Tasman Sea in the old *Southern Cross*, and then came to England by K.L.M. to make another attempt on the solo record to Australia, then held by C. W. A. Scott. This time he chose a Gull, and he duly set up a new record of 7 days 4 hours 44 minutes, although he was ill on the way and had to spend one day in bed at Gwadar. Of the crossing of the Timor Sea that time, he remarked, "I don't like travelling over the sea with one engine."

The Australian Government made him a grant of £3,000, and he joined the Vacuum Oil Co. as aeronautical adviser.

"Lady Southern Cross"

In 1934 he made his third return crossing of the Tasman Sea. Then he ordered a Lockheed Altair, intending to enter for the MacRobertson Race. He could not get an airworthiness certificate for the machine when loaded up with all the petrol which he considered would give him a chance in the race, and so withdrew. He had named the machine *Lady Southern Cross*, and had had it shipped to Australia. So he flew it back to Oakland to sell it, but finally stored it there. This Pacific crossing on one engine was one of his most reckless flights, and showed that his old principles had been abandoned.

Last summer he had the Altair shipped to England, and on November 6 started out on the fatal flight to Australia, which finally proved that a single engine cannot be trusted indefinitely for a long sea crossing. Kingsford Smith's early successes and his tragic end alike have vindicated the principle of caution in long-distance flying.

Thomas Pethybridge, who was lost with him, had been chief instructor at the Kingsford Smith Air School in Sydney. He was reckoned one of the best pilots in Australia. He accompanied his chief to California lately to collect the Altair, and together they flew it to New York, where it was shipped to England.

THE MILITARY RAPIDE

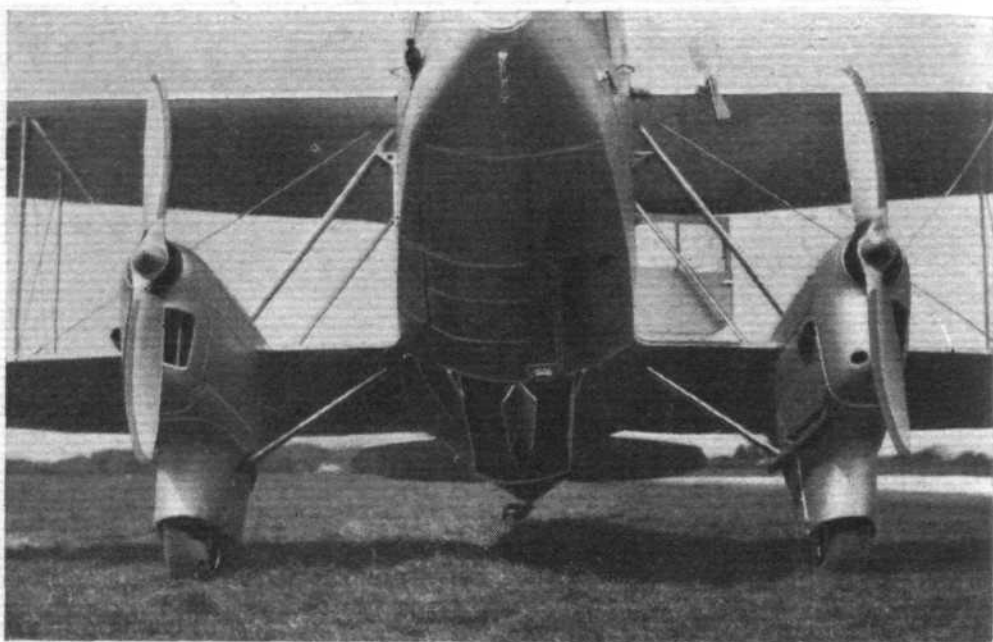
For Coastal Reconnaissance and G.P. Duties : Interesting Armament Installations : Internal Bomb Stowage

WITHIN the past few months the R.A.F. has given official recognition to a new class of aeroplane, a type intended for coastal reconnaissance and, to a certain extent, for offensive measures against enemy shipping. The tactical uses to which such a machine could be put are legion. In addition to undertaking the duties already mentioned it could be employed to escort torpedo bombers and shipping, to patrol long stretches of coast line, and to undertake anti-submarine work, for which it is provided with bombs.

It is now permissible to describe a three-seater coastal reconnaissance version of the Rapide or D.H.89 civil biplane which has been produced by the De Havilland company to perform all these duties. Obviously the machine could also undertake, over land or sea, the multifarious jobs of the general-purpose aircraft, or act as a troop carrier or an ambulance, making it an attractive proposition to air forces in which the economical operation of aircraft is of paramount importance.

Structurally the machine is similar to its civilian forerunner, and consequently this description will deal only with the features peculiar to the military version. Actually, it applies to the prototype machine supplied to the R.A.F.

The pilot's roomy cockpit is located in the nose of the fuselage. There is an extremely complete instrument board and a tapping key to operate signalling lights both on top of and below the fuselage. On the starboard side is a Mark III Vickers belt-fed machine gun with its breech easily accessible. The feed block is on the left of the gun and cartridges are fed from a box containing 400 rounds beneath the pilot's seat. There is a Very light pistol in the cockpit, which is also provided with a light and dimmer switch, and a drift sight is let into the floor. A bomb release is also provided for the pilot.



Two 100lb. bombs are carried inside the trap doors, here seen agape. The pilot's fixed Vickers gun, on the starboard side of the nose, is also shown. (Flight photograph.)

In the front portion of the fuselage, where he can easily talk to the pilot, is the observer-bomber. Just to the rear of the pilot's seat is a hole, with a sliding hatch, for bomb sighting purposes, and behind the Vickers gun is an electrical bomb switch with selectors and releases and the handle for opening the sliding hatch which covers the four 20lb. bombs.

As the bomber lies down to sight the bombs he finds an instrument board in front of him, together with an altimeter, A.S.I. and temperature gauge. The navigator's sighting compass, which may be placed on the outside of the machine for taking bearings, is normally situated just above this board.

On the left-hand side of the fuselage is the navigator's table with a watch, course and distance calculator and chart board.

The bomb load consists of two 100lb. and four 20lb. bombs, the former being slung in the middle of the fuselage and accessible from the inside of the machine through the doors of a raised box on the floor. When released they fall through spring-loaded trap doors in the belly of the fuselage which then close automatically after the projectiles have left.

Opposite the navigator sits the radio operator, who has a similar table and transmitter, receiver and switchboard mounted in front of him. On the right-hand side of the fuselage is stowage for three parachutes for the crew. Other items



This view shows to advantage the special D.H. gun mounting which may be completely concealed when not in use (Flight photograph.)

are a rack to take four flares and two fire extinguishers and a first-aid box, the latter being accessible from the outside of the fuselage by ripping off a small fabric panel. At the

extreme rear of the cabin are the four 20lb. bombs already mentioned.

An ingenious gun mounting of De Havilland design is provided for the rear gunner, who sits on a swivelling seat. The ring itself is mounted on roller races, and it is claimed that, when the gun is fitted, it can be rotated by the pressure of one finger. For any firing position, except that for ground strafing, the gunner sits, and the greater the angle of elevation the higher the position of the gun. In other words, the height of the gun varies with the eye of the gunner instead of the gunner having to adjust his height to that of the gun. When not in use the whole gun and its mounting can be folded away in two or three seconds, the whole being covered by a sliding hatch. Stowage for eight 97-round drums of ammunition is provided.

Between the cross tubes of the top centre section is installed a Youngman flotation dinghy which is normally deflated and retained by a three-ply cover. Should the machine descend into the sea, this dinghy is automatically inflated from a cylinder of compressed carbon dioxide, whereupon it bursts its covering and floats, providing means of keeping the machine afloat and of allowing the crew to leave the scene of the descent. Attached to the dinghy are two marine distress signals and a hand inflator.

D.H.89 (CONVERSION)

Three-seater Coastal Reconnaissance Biplane.
Two D.H. Gipsy Six engines (200 h.p. each).

Dimensions.

Span	48ft. (14.63 m)
Length	34ft. 6in. (10.52 m)

Weights and Loadings.

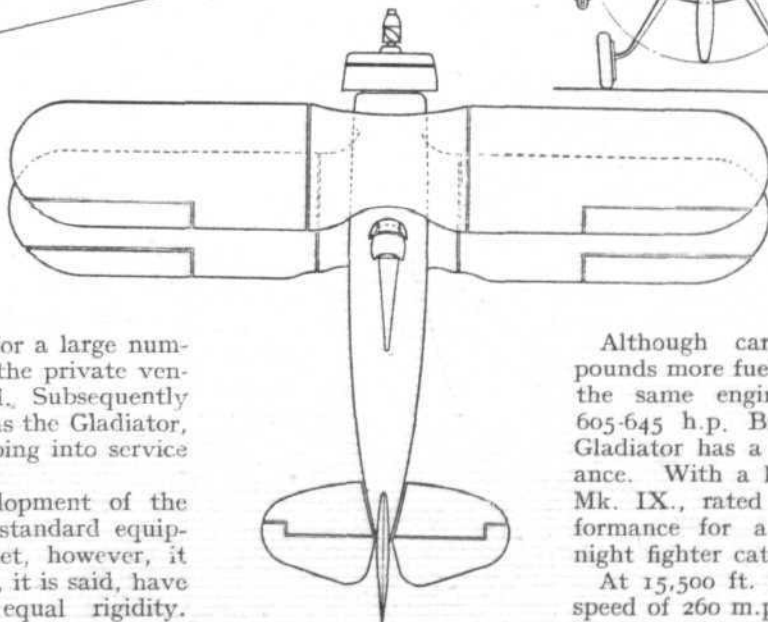
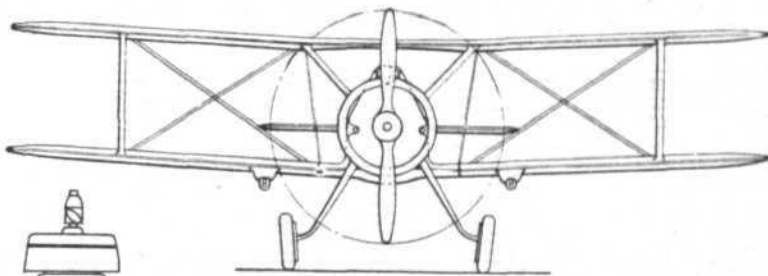
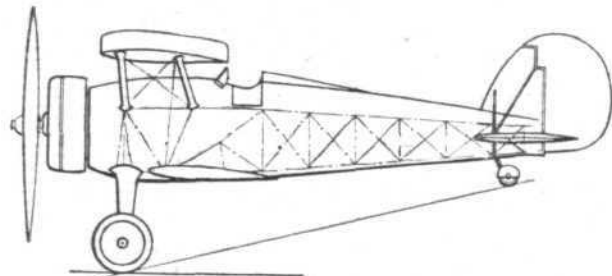
Weight Empty (with fixed mil. load)	3,389 lb. (1,539 kg)
Gross Weight	5,450 lb. (2,474 kg)
Wing Loading	14.9 lb./sq. ft. (75 kg/m ²)
Power Loading	13.3 lb./h.p. (5.95 kg/cv)

Performance.

Maximum Speed at sea level	151 m.p.h. (243 km/hr)
Maximum speed at 10,000 ft. (3,050 m)	140 m.p.h. (225.5 km/hr)
Cruising speed at 1,000 ft. (305 m)	128 m.p.h. (206 km/hr)
Range	550 miles (885 km) plus $\frac{1}{2}$ hr. at full throttle.
Climb to 10,000 ft. (3,050 m)	17.5 min.
Service ceiling	17,100 ft. (5,220 m)
Absolute ceiling on one engine	3,500 ft. (1,070 m)

FOR THE SERVICE ARENA

*The Gloster Gladiator Day and Night Fighter : First Performance Figures
Disclosed : 260 m.p.h. at 15,500 ft.*



THE last competition held by the Air Ministry for single-seater day-and-night fighters resulted in the placing of an order with the Gloster Aircraft Company for a large number of machines similar to the private venture type which it submitted. Subsequently the aircraft became known as the Gladiator, and as such will soon be going into service with the Royal Air Force.

Essentially it is a development of the Gauntlet, which is already standard equipment. Unlike the Gauntlet, however, it has single-bay wings, which, it is said, have been arranged to give equal rigidity. Another innovation is the single-strut cantilever undercarriage, which is fitted with Dowty internally sprung wheels, and which is reported to have given entire satisfaction during service trials. There are four machine guns—two in the fuselage and two below the bottom planes.

The wings embody "dumbbell" spars and duralumin ribs, and the fuselage construction is generally similar to that employed in the Gauntlet.

Although carrying some hundreds of pounds more fuel and equipment, even with the same engine as the Gauntlet (the 605-645 h.p. Bristol Mercury V.I.S.), the Gladiator has a greatly improved performance. With a later type of Mercury—the Mk. IX., rated at 685-715 h.p.—the performance for a biplane in the day-and-night fighter category is quite amazing.

At 15,500 ft. the Gladiator makes a top speed of 260 m.p.h. It stalls at 60 m.p.h., climbs to 10,000 ft. in 4½ mins., and to 20,000 ft. in 9 mins. 20 secs. Its service ceiling is 35,000 ft. The weight empty is 3,234 lb., and with full military load, which includes wireless, oxygen and night-flying gear, the machine weighs 4,400 lb.

THE BRITISH AIRCRAFT INDUSTRY

A fortnight hence there will appear a special issue of *Flight* that will form a valuable work of reference—the annual BRITISH AIRCRAFT INDUSTRY NUMBER.

THURSDAY

FLIGHT

DECEMBER 5.

COMMERCIAL AVIATION

— AIRLINES — AIRPORTS —



ECONOMICAL COMFORT : A new impression by a *Flight* photographer of the Heston Phoenix, which carries four passengers, a pilot and luggage at a cruising speed of 125 m.p.h. on 200 h.p.

THE WEEK AT CROYDON

India to Holland in Two Days : An Automatic Pilot in Service : Infra-Red for Blind Landings : Linking Airport and Office : Saving Time

ON Tuesday, November 12, Lady Chetwode, wife of Field Marshal Sir Philip Chetwode, Commander-in-Chief in India, came through by K.L.M. from Karachi. Incidentally, on a previous service Comdr. G. J. Geisendorffer was held up by weather in the early stages of the Batavia-Amsterdam flight, and, in order to make up time, he flew a Douglas from Karachi to Amsterdam, a distance of close on 5,000 miles, in two days.

During last week Dr. Thost left by D.L.H. for Berlin, owing to non-renewal of his permit to remain in England. He was correspondent of the Nazi organs, *Angriff* and *Völkischer Beobachter*, and will always be remembered as the man who gladdened British hearts by seeing Jewish propaganda in the cartoonist Strube's "little man." He described his queer-shaped bowler hat in all seriousness as a Jewish helmet.

Wrightways, I am told, have had excellent results with the P.B. automatic pilot during some eighty hours' early-morning flying in weather fit to freeze up most instruments. K.L.M., by the way, are showing keen interest in the P.B. instruments, and Capt. Philip Bailey is seen from time to time entering one of this company's machines for a business trip to Amsterdam.

Surrey Flying Services report considerable activity in flying instruction, somewhat hampered by the wicked weather experienced lately. The company has built up another Moth, and this brings the training fleet up to five.

The import of dogs and cats is still a vexed question, owing to licence restrictions. The latest development is an assurance from the Air Ministry that if their traffic hands land these animals, thus rendering the company liable to a £50 fine, no responsibility lies with the Ministry!

Charter work, Capt. Olley tells me, has been rendered extremely difficult by flooded and semi-flooded aerodromes, and more attention will need to be paid to drainage in the future.

Considerable interest was displayed here last week in a demonstration of a new device to Air Ministry and Air Traffic Company officials. Briefly, this is designed to allow an aeroplane to pick up, presumably with an infra-red detector, an ordinary beam of light from, for example, the existing airport

floodlight somewhere about six miles away in any weather, thick fog included. The machine can then fly down the beam, set at a reasonable gliding angle, until the airport is reached. Incidentally, the same device or an adaptation of it has been approved for use by one of the biggest shipping companies, and it is interesting to note that the sun, when totally obscured, can be "shot" with a similar device.

On Thursday of last week several early-morning aeroplanes, extra to schedule, left Croydon for the North of England with special loads of election editions of newspapers. Amongst them were two machines of Imperial Airways, and one each from Commercial Air Hire, Air Taxis, and Surrey Flying Services. Imperial Airways, incidentally, have fitted that expensive but highly efficient machine, a teleprinter, at Croydon with an opposite number at Airways Terminus, London. Close and accurate co-operation between city office and airport is all-important, and telephone errors will be eliminated by this means in such matters as passengers' names—to give but one example.

Ambulance Work

Several British firms specialise in air ambulance work and have fitted aeroplanes with special stretchers. Early last week Commercial Air Hire, Ltd., had an air ambulance case from Plymouth to Croydon, and on landing the accompanying doctor remarked that the patient could not have stood the journey by any other means of transport, and had actually enjoyed the flight.

I understand that the K.L.M. medical officer, Dr. Slotboom, has recently had certain machines fitted with scientifically sprung beds, and that an arrangement of mirrors allows the patient to observe the scenery although lying prone.

Up to the present the only alternative port of refuge at which any facilities have been installed by the authorities has been Lympne, though airports nearer London or with better ground transport facilities are now being prepared, thanks very largely to private enterprise. Lympne is not only poorly placed, but is far from London in time as well as miles.

Commercial Aviation

Imperial Airways' senior pilots have been seen lately in impressively smart Navy pattern dark blue overcoats with gold rank badges on the shoulders, brass buttons, and a belt with brass buckle. It is certainly an improvement on the rather sloppy blue raincoat which now appears to be relegated to the junior ranks. Talking of which, Croydon is not the place it used to be, when everybody knew everybody else, for nowadays there are endless probationary first officers, pink and white lads many of them, whom one is irresistibly tempted to refer to as "madchens in uniform." Their gambols sometimes amuse. One lady is said to have rung up Imperial Airways and asked for Mr. —, who had just conferred the honour of his presence upon the company. Unhappily, nobody

knew the lad. "But you *must* know Mr. —," said the lady; "why, everybody knows him as Bertie, the blonde ace."

Sunday last was the day of the "old crocks'" run to Brighton, and they all passed the Airport. Police traffic arrangements were such that Purley Way had two lines of parked cars, one each side of the road, and two lines of moving traffic; consequently, there was very little room for the "old crocks," and practically none for anyone else. Some people in a hurry to get to the Airport and to catch a machine just missed it, and that was that. I have infinite sympathy for all "old crocks," but precious little for young and active policemen who have not enough sense to allow parking on one side only of a very busy thoroughfare.

A. VIATOR.

American Safety

DURING the first half of 1935 the scheduled air services in the United States set new safety records by flying 40,714,686 passenger-miles for every fatality. There were actually twenty-nine accidents, of which five were fatal, in the 28,729,128 miles flown, and a total of 377,339 passengers were carried.

Night Flying in Sweden

THE Swedish Aerotransport Company hopes next year that, when the new Stockholm airport at Bromma is completed and the air route between the Swedish capital and Malmö is fully ready for night traffic, the night air mail between Stockholm and London shall function all the year round.

A.B. Aerotransport, incidentally, has just carried its 150,000th passenger. The company's machines have now flown 3,750,000 miles with 150,000 passengers in the ten years or more during which it has been in existence. Not a single accident to a passenger-carrying machine has occurred.

Developments in New Zealand

THREE Avro 652's have been ordered by Great Pacific Airways (N.Z.), Ltd., after an investigation of airways in U.S.A. and Great Britain during the last four months.

Provided that the machines can be delivered in time the company expects to commence its Auckland-Dunedin service by next June or July, but in any case the operation of the service will be provisional on the granting of a Government subsidy in the form of a mail contract or otherwise.

The directors are quite confident their subsidy proposals will receive favourable consideration.

As already announced, Union Airways of N.Z., Ltd., have purchased D.H. 86's for their trunk service between Palmerston and Dunedin. They will also use a Miles Falcon for emergency and taxi work.

The first machine is due at Lyttelton on November 27, and the other two on December 13. Pilots, co-pilots, and all other necessary personnel have been engaged, and the company expects to inaugurate a daily service with mails each way early in January.

A licence to operate New Zealand Airways' old Boeings had been refused, but a restricted licence has now been granted. The company already holds a licence for a service connecting Timaru, Queenstown and Dunedin, with the right to call at Ranfurly and Roxburgh, but the Queenstown and Roxburgh grounds are not licensed yet.

The mail traffic on the west coast has now become so great that it has often been found necessary to make one trip with mails and another with passengers. Bearing in mind the fact that the busy tourist season is approaching, Air Travel (N.Z.), Ltd., have decided to employ another Fox Moth, a licence for which has now been granted. The company will probably have a twin-engined machine next year. The Fox Moth, incidentally, was previously owned by the Prince of Wales.

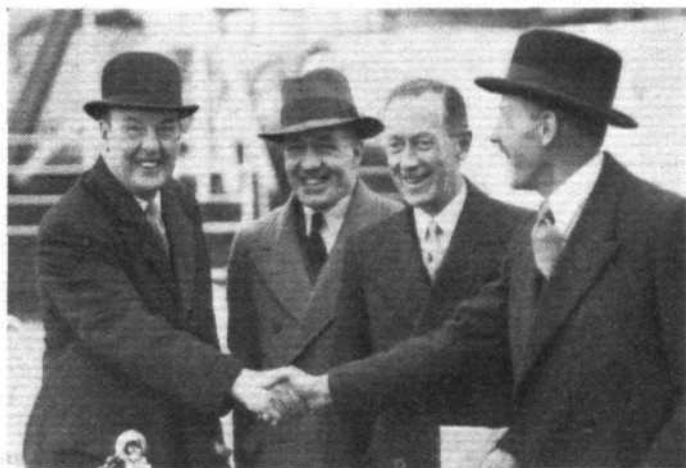
Captain J. C. Mercer, the managing director, has supplied some very interesting details of the remarkable development of traffic on their service over South Westland. Originally he had planned to carry 100 lb. of mail a week, but the first quarter's returns showed this to be nearer 140 lb., while the second and third quarters showed 280 lb. and 325 lb. respectively. During the nine months well over a thousand flights had been made and 1,100 passengers had been carried.

Two D.H. Rapides for Cook Strait Airways, Ltd., are due to arrive at Auckland on December 1, and after being assembled at Hobsonville Air Base will be flown to Wellington. A D.H. 90 will also be used as a feeder machine and air taxi in conjunction with their Cook Strait service.

Transatlantic Co-operation

COL. SIR DONALD BANKS, K.C.B., D.S.O., M.C., Director-General, General Post Office: Lt. Col. F. C. Sheldermine, C.I.E., O.B.E., Director-General of Civil Aviation, Air Ministry; and Mr. G. E. Woods Humphery, C.B.E., Managing Director of Imperial Airways, Ltd., accompanied by officials of the Air Ministry, Dominions Office, and General Post Office, left for Ottawa last Wednesday morning in order to discuss with the Canadian authorities the establishment of a Transatlantic air service.

Proposals for the establishment of such a service have been the subject of discussions between officials of the Governments of the United Kingdom of Great Britain and Northern Ireland and of the Irish Free State. Representatives of the Irish Free State and of Newfoundland will also participate in the discussions which will take place at Ottawa.



This country's first pilot, Lt. Col. J. T. C. Moore-Brabazon, sees Mr. Woods Humphery, Lt. Col. Sheldermine and Col. Sir Donald Banks off at Liverpool.

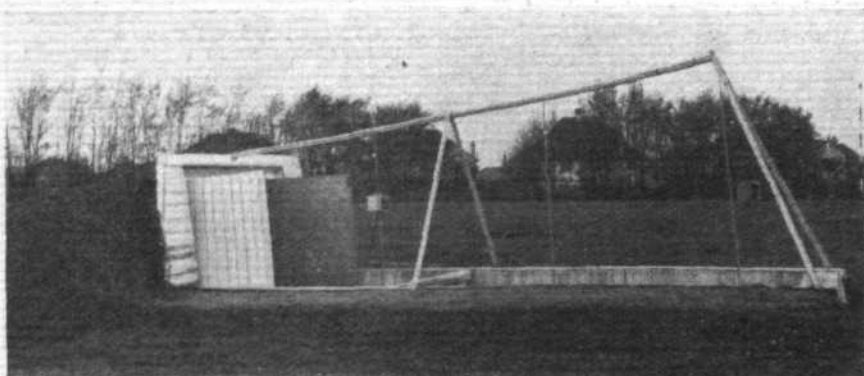
Tata's Three Years

STARTING on October 15, 1932, with two D.H. Puss Moths and a staff of five to operate the Karachi-Madras service, the aviation department of Tata Sons, Ltd., now employs forty persons. Originally for mails only, passengers are now carried on this service, and with the new Miles Merlins it is expected that the journey will be completed in one day.

Apart from the long-awaited extension from Madras to Colombo, and the nightly service between Bombay and Calcutta, expected developments include a weekly 780-mile service between Bombay and Trivandrum (in Travancore), and this, as reported in *Flight* last week, was actually inaugurated on October 29. This service provides, of course, a through connection between the West Coast and Europe. In due course Tatas will cover a route mileage of 2,750.

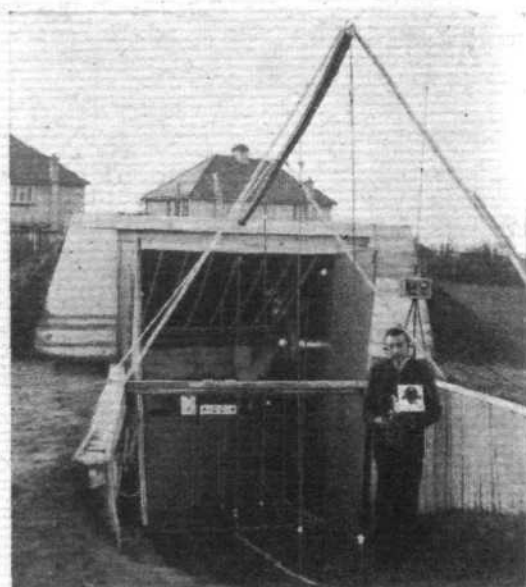
The mail carried on the trunk route did not at first really justify an air service, but the company persisted, and after fifteen months the operations became self-supporting. During the first two years a hundred per cent. reliability was maintained—a performance which, remembering the lack of radio facilities and of emergency landing grounds, is more than praiseworthy. Needless to say, a certain amount of charter work is undertaken when machines are available for this purpose, and some fast long-distance flights have been made.

The larger scale of operations has caused the cost per ton-mile to be reduced by 23 per cent. since the service was started.

Commercial Aviation

ANOTHER BLIND LANDING SYSTEM

Short Wave Experiments at Croydon : Superimposed Beams and Marker Beacons : An Ingenious "Time Factor" Instrument



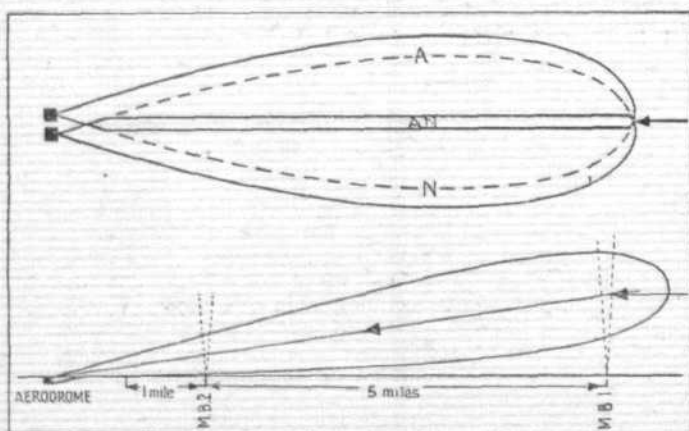
On the left the special aerial system is shown, while, above, Mr. Sharman stands in front of his screened dugout at Croydon. (*Flight* photographs.)

IT would seem that the short-wave deformed beam is likely to form the basis of all blind approach or blind landing systems—at least on this side of the Atlantic.

The latest system, which has been developed by Mr. David Sharman, B.Sc., resembles the now well-known Lorenz system (described in *Flight* of February 14 this year), however, only in so far as overlapping beam formations are used.

Mr. Sharman, who has been working on television and short wave transmission for several years, has installed his apparatus in a dugout beside the temporarily disused beacon at Croydon aerodrome, and a number of successful tests have been made with a field strength indicator.

Briefly, the system involves the use of a perfectly straight-forward short-wave (5-9-metre) transmitter and aerial, with three resonators arranged to prevent as far as possible useless emanations and to direct the beam. By means of suitable earthed screening, and assisted by the fact that the whole apparatus is below ground, Mr. Sharman claims to have eliminated the usual addition beam formations.



These purely diagrammatical sketches illustrate the principle of the Sharman system which is used in conjunction with two marker beacons.

In addition, this screening is used to "flatten" or weaken one side of the beam, as viewed from above, in such a way that the maximum signal strength occurs near this flattened portion. It is in this artificial deformation that the crux of the system lies. By means of two partially superimposed deformed beams a comparatively narrow area of overlapping can be arranged so that the lateral limits of this area are approximately parallel. Although it would not be claimed that these deformed beams are, in fact, of any clearly defined shape, the general effect can so be described. With two syn-

chronised transmitters emitting "A" and "N" signals, the line of approach would be indicated as a continuous note.

Viewed in elevation the beams would have their approximate centre line arranged to suit the average gliding angle of approaching machines, and it is worth noting that both the angle and direction of these beams can easily be modified between reasonable limits. Two marker beacons—such as are to be installed, in any case, for the approach to Croydon—would indicate to the pilot his position on the way in.

To be used in conjunction with his system, Mr. Sharman has suggested a most ingenious instrument which, however, is likely to give the developing firm—Messrs. Short and Mason—something to think about. Apart from marker beacon indicator lights, a hundred-foot "danger" light, and a visual "homing" indicator, this self-contained instrument is also an altitude and distance meter. Adjustments for different barometric pressures, air speeds and wind speeds must be arranged so that the single clockwork animated hand on the multiple dial can simultaneously give the pilot his calculated distance from the aerodrome, his altitude to within ten feet or so, and his actual time of flight from the moment of passing the first marker beacon.

The difficulties will, of course, be overcome, and such an instrument should be an extremely useful one, even though we are sceptical of Mr. Sharman's claim that the pilot would be able to judge his actual moment of hold-off in conditions of zero visibility with its assistance. That remains to be seen.

Nevertheless, at the second marker beacon the pilot would be able to see at once whether the calculated wind speed correction was in order and there would still be time to make another circuit while receiving later information.

One of the advantages of the Sharman system—which, incidentally, involves a transmitter with a consumption of less than 30 watts—is that it could be used, if necessary, as a mobile unit.

A Bigger Sikorsky?

AN American contemporary gives the following information on the projected Sikorsky flying boat which, it says, will be employed on the Atlantic and Pacific services of Pan American airways.

In span the boat will measure 400ft. and will be about 200ft. long. Power will be supplied by six radial engines of 1,000 h.p. each, and the range, at an all-up weight of 112,000-115,000lb., should be about 5,000 miles flying at between 12,000 and 20,000ft. From 30 to 40 passengers will be carried, and there will be fifteen private cabins, each containing from two to five sleeping berths. A smoking lounge, with bar, an observation lounge and a small library will be among the amenities, and the dining room will accommodate twenty at a session. The wing, being seven feet thick at its deepest part, will permit passengers to walk up and down its interior and to look through a transparent portion.

EX-HESTON

A Traffic Control Change : The One and Only : Instructing the Expert : A Landing Light Development

ON Monday, November 11, the Air Ministry assumed control of traffic at Heston. This arrangement is independent of the ownership and general operation of the airport.

Mr. J. Jeffs has been temporarily posted from his duties as Control Officer at Croydon in order to take charge of operations at Heston. At a time when organised airport control in England is still the exception and not the rule, Heston is particularly fortunate in the supervision of Mr. Jeffs, whose twelve years' experience of the work was preceded by service on the staff of the Air Ministry, and, during the war, in the R.N.A.S. and R.A.F. The extension to Heston of Air Ministry traffic control involves no changes in equipment, but the benefits of such centralisation of responsibility are clear.

Jersey Airways achieved the distinction of operating the only aeroplane to take off or land at Heston on Thursday, November 7. They ran to schedule, taking off blind in almost zero visibility in the morning, and landing again in the afternoon when the fog had been replaced by a driving rainstorm. The pilot was Mr. J. M. Israel.

The Sunday services of Spartan Air Lines and United Airways have been suspended for the winter. Spartan Air Lines, incidentally, have added an attractive concession to the ordinary interavailability of air and rail tickets which has been in operation on certain air lines for some time. For 30s. (first class 35s.) on any week-day except Saturdays, it is possible to travel to the Isle of Wight by air and return the same day by rail.

Spartan Air Lines have acquired a Gipsy I Moth with hood and instruments for blind flying. This will be used to give their pilots instruction in instrument flying additional to the compulsory requirements for a commercial licence. Flt. Lt.

J. Pugh, who will act as instructor, gained valuable experience at the time when he piloted Commercial Air Hire's newspaper service daily from Croydon to Paris in the small hours. Furthermore, he was, of course, a pilot in the meteorological flight at Duxford.

Since the removal of the Air Ministry meteorological broadcasting station from Heston to Borough Hill, Northamptonshire, pilots have complained that Heston weather is not included in the reports for the South of England. Flying to Heston from the Midlands they have to "make do" with a report of the weather at Croydon or Farnborough, which may be very different. Arrangements have now been made for a Heston report to be included in the hourly broadcasts.

Mr. Parkes Moves On

Mr. J. J. Parkes, who has been with Airwork since the company was formed, is to take up a position with the De Havilland Aircraft Company early next year, when he returns from his annual inspection of Airwork's overseas activities. Mr. Parkes is probably one of the most versatile people in aviation (he has flown over eighty different types of aircraft), and it is no surprise that he is now turning to the manufacturing side, to add to the variety of his experience.

Airwork has designed a special mounting for a Vickers-Philips landing light on D.H.89 machines. Lights have now been fitted in this way to six machines on internal airlines in this country, three the property of Crilly Airways and three of United Airways. Three Hillman aeroplanes are shortly to be equipped at Heston in the same way. The Airwork mounting, which is in the nose of the machine, gives the pilot full control of the angle of the beam, and is, it is claimed, much less costly than other designs.

Licences in New Zealand

AT a recent meeting of the Transport Co-ordination Board uniform minimum fares were fixed for air taxis, and a number of amendments made. Flights to any part of the country are now permitted, a decision which affects all aero clubs, as well as most of the present air transport companies.

A New F.36

IT is stated that the Fokker Company have submitted to the K.L.M. designs for an improved version of the four-engined F.36—the F.36-B. It has the same dimensions as the F.36 and can carry an equal number of passengers (32), but otherwise it represents an entirely new type. It has a retractable undercarriage, and the performance will be higher and the useful load a few hundred kilograms greater. The company guarantees a maximum speed of 205 m.p.h.

Jersey's Airport

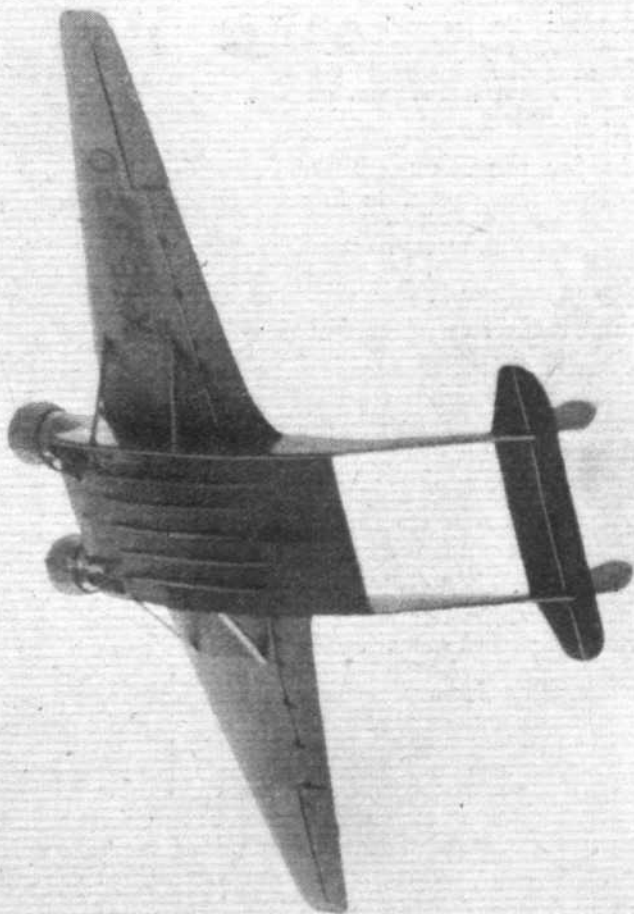
A PROPOSAL to expend a further £27,000 on necessary improvements and additions to the airport which is being laid out at St. Peters, Jersey, was recently placed before the States of that island and deferred for consideration.

The grant is needed to fit out the aerodrome for night flying, and for the installation of D/F equipment. These suggestions are concerned with a mail contract which Channel Island Airways hope eventually to obtain.

The New Navigation School

FURTHER details are now available concerning the projected courses at The Imperial School of Navigation, mentioned on p. 517 in last week's issue. There will actually be two intensive courses for the 2nd Class Navigator's examination—the first starting in December for the January event and the second starting in January for the March examination—in addition to the long course for the 1st Class Navigator's examination.

The special navigation courses for "B" licence aspirants will each last for five weeks, the first starting on December 2, and lectures will be given on each day between 4 and 6 p.m. The school will only be a minute's walk from the Notting Hill Gate underground stations, and further information can be obtained by ringing Whitehall 8845, or by writing to the address already given.



UNCONVENTIONAL: This unusual view of the Burnelli UB-14, taken by the Shell company, clearly shows the aerofoil section of the fuselage and the new tapered wings.

THE FOUR

ITEMS OF INTEREST FROM



FOR EXPRESS DELIVERY of just retribution and similar loads: The new Bristol 142 (two Bristol Mercury VI S engines), which is credited with a top speed of about 270 m.p.h. A modified version is being built as a medium bomber for the Royal Air Force. Other aerial photographs of this noteworthy machine appeared in *Flight* last week. (*Flight* photograph.)

An Empire Airway Show

Sir Eric Geddes will open "The Empire's Airways Exhibition," organised by Imperial Airways, at the Science Museum, South Kensington, on Thursday, December 5.

Ruin for the Rum-Runners?

Seven cutters, 328ft. in length and designed to carry aircraft, are being built for the U.S. coastguard.

Contrabandoned

An abandoned aeroplane packed with several hundred pounds of tobacco has been seized on the sands near Dunkirk by French Customs authorities. A viscountess and two alleged accomplices have been arrested.

"Lion of Judah" Buys British

Having admired the Percival Gull chartered from Brian Allen Aviation, Ltd., by the *Daily Telegraph*, the Emperor of Abyssinia has ordered four Gulls from Gravesend. They are to be used by his staff on communication work.

For Speedy Survey

It is reported that Mr. Philip P. Whitmarsh, a millionaire sportsman and explorer, has bought a Lockheed Vega which he will take to Africa and survey the possibilities of establishing several feeder services to the Imperial Airways trans-African line.

Astral Archie?

Flying 1,500ft. above Tunbridge Wells last week, Mr. J. W. Duggan, of Wrightways, had an unusual experience. He reported that something burst beneath

his machine and that there was a vivid flash. At first he thought a rocket was the cause, but decided that the light was far too brilliant, and supposes that actually it was a meteor.

Congratulations

Two recent "personal" announcements are of interest to the aviation world: Capt. W. Courtenay, the well-

known aeronautical journalist, is to be married to Miss Harriett Appleby at St. Mark's, North Audley Street, London, at 12.30 p.m. on December 14; and the engagement is announced of F/O. R. E. G. Brittain, son of Sir Harry and Lady Brittain, to Miss Louise Watt.

Stratosphere to News-room

While the stratosphere balloon *Explorer II* was making its 74,000-foot climb, recorded in these columns last week, a representative of *The Daily Telegraph* in London spoke by radio with the two occupants, Captains Albert W. Stevens and Orvil Anderson. Amateur short-wave enthusiasts in this country were amazed and delighted at overhearing the conversation.

A Big Baby Christened

A traveller in Germany reports that a few days ago she witnessed the christening, in the presence of General Goering and to the accompaniment of much martial music, of a very large twin-engined monoplane bomber, which might have been the Dornier, of which there have been widespread whisperings.

Close Pursuit

Every year the Mitchell Trophy is put up for a race between "pursuit" pilots of the U.S. Army Air Corps. This year it was won by Capt. Karl E. Gimmmler at 212.96 m.p.h., the second and third machines to finish the course (all entries were Boeing P-26A's with Wasp engines) clocking 211.93 and 211.43 m.p.h. respectively over the 25-mile course. Fuel of 100 octane number was used by all. A gusty wind kept the speeds this year below the 216.83 m.p.h. averaged by last year's victor.



DIABOLICALLY ANGELIC. Mr. Howard Hughes, the young millionaire producer of the film *Hell's Angels*, who recently broke the world's speed record for landplanes in a monoplane built by his own aircraft company. He intends to submit a modified version to the U.S. Army as a pursuit machine.

WINDS

L QUARTERS

Veterans Coming to Town

Five famous war-time aeroplanes, including the Short seaplane flown at the battle of Jutland, and the Sopwith Camel in which Lt. Culley, taking off from a lighter towed behind a destroyer, brought down Zeppelin L.53, are to be transferred from storage to the new premises to be occupied by the Imperial War Museum at Geraldine Mary Harmsworth Park, Southwark.

Exposition Exposed

Using flashlight bombs of 500,000,000 candle-power from a Fairchild flying at 1,500 ft., a lieutenant and a technical sergeant of the 23rd Photo Section, U.S. Army Air Corps, secured an amazingly detailed picture of the International California Pacific Exposition at San Diego at 9.30 one night. The "bombs" virtually turned night into day and made even pedestrians clearly visible.

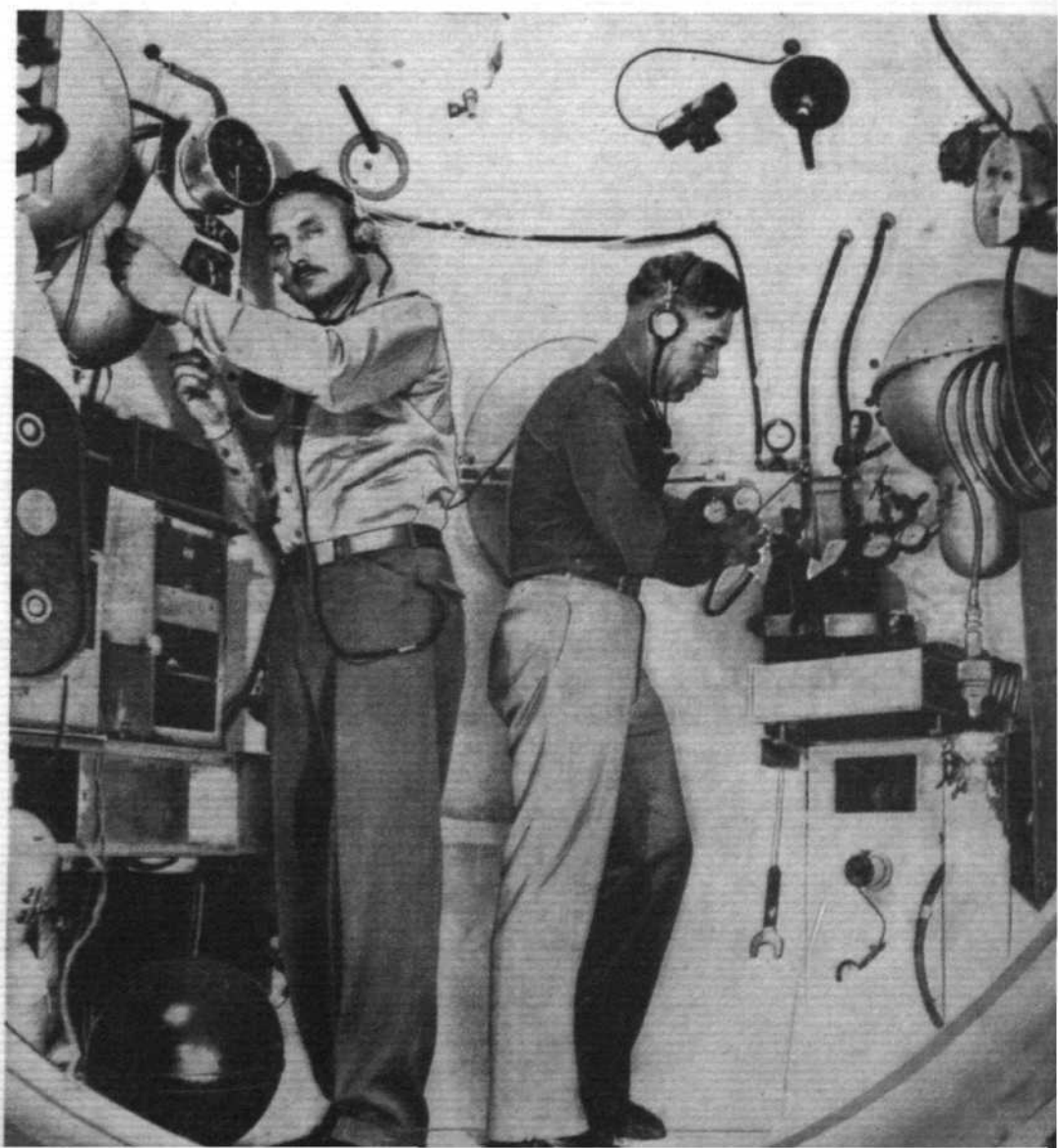
Following the Flow

A specially constructed Fairchild 22 high-wing open-cockpit monoplane (145 h.p. Warner Super Scarab engine) has been delivered to the National Advisory Committee of Aeronautics at Langley Field, Virginia, for work in connection with the study of the aerodynamic characteristics of experimental wings in flight. Two special wings have already been delivered by the Fairchild Company. Each is of a new section; one is fitted with special flaps, and the other with special slots.

Twenty-five Years Ago

(From "Flight" of November 19, 1910)

"On Monday Mr. Seddon brought out his huge tandem biplane for the first time. The weight of the machine, however (which is somewhere between 20 and 30 cwt.), proved too much for the axle of the right wheel, which gave way. This machine is fitted with two N.E.C. engines of 50-60 h.p. each.



(Top) "ON THE COMMAND 'ONE' . . ." Prop.-swinging instruction at the R.A.F. Reserve school at Hanworth, operated by Flying Training Ltd. The machines are Blackburn B.2 Trainers.

(Centre) THE FLAPS of the Bristol 142. Another noteworthy point in this view is the amount of "visibility" surrounding the pilot. (Flight photograph.)

(Bottom) STRATOSPHERICS: A study of this photograph of the interior of the Explorer II balloon's gondola leaves no doubt about the genuinely scientific nature of the 74,000 ft. ascent reported last week. Capt. Albert Stevens (left) and Capt. Orvil Anderson, of the U.S. Army Air Corps, kept in touch with the ground by radio throughout the ascent.

"FIFTY BELOW"

Operating an Autogiro in the Antarctic : The Report of a Pilot Attached to the Byrd Expedition

ON the way south the motor and Autogiro units had to be prepared for flying in sub-zero weather. The motor was cowed and lagged in the usual manner, and each oil line was lagged with asbestos, then taped and shellacked. An asbestos-lined metal box was made for the oil sumps. Each cylinder of the motor was cowed up to the combustion chamber and a special cowling was made to go over the opening around the crank case. In this manner all openings were covered, so that most of the air flowing through the motor was stopped. A paste was made out of flake asbestos and water for the lower starter unit; this was put on, and then covered with asbestos cloth, taped and shellacked.

There was also a special drain on the bottom of this unit so that after each flight all the oil could be drained from the system. The Marfax grease in the rotor head and upper starter unit was replaced with a combination of Pyroil and regular heavy Veedol grease. The Houdil oil in the dampers was replaced with straight Pyroil. There was no change in the landing gear struts. The rubber bumper blocks were left on the rotor head, and they became very hard in the cold weather; however, the blades were not noticeably rougher.

After arriving at the Bay of Whales the Autogiro was rigged and flown from the Bay of Little America approximately seven miles away. The usual procedure was followed in revving up the blades. The ski freeze to the snow, which makes it very convenient in starting the blades; after about 110 rotor revs have been obtained the ski break loose.

Before leaving the United States the blades were flattened one degree. This resulted in their turning somewhat faster, and a somewhat longer run was required in take-offs; however, a big advantage was gained in landing in high winds. The highest wind in which the Autogiro was flown was 20 to 25 m.p.h. Upon landing there was no hesitancy—that is, there was no tendency of the ship to balloon.

A Rescue Flight

In January, February and March, 1934, approximately seven hours were flown, which was mostly local reconnaissance. The temperature during this time was from 30 below to 25 above zero Fahrenheit. The most outstanding flight of this period was the location of the lost airplane, for on that occasion the Autogiro carried an overload of 384 lb., with a tent strapped to the side and a sledge lashed underneath the fuselage. Terrain was bumpy and traversed by high sastrugi. Difficulty was found in turning the ship around after landing, for the wind tended to make her into a weathercock. On these flights the wind speed was 20 m.p.h.

During the winter nights the blades and tail surfaces



An early Kellett cabin Autogiro, of the type used on the Byrd expedition.

Although somewhat belated, there is unusual interest in this report by the pilot, W. S. McCormick, on the operation of the Kellett Autogiro which formed one of Rear-Admiral Byrd's aircraft fleet on his Antarctic expedition in 1933-1934. It at least demonstrates that extreme cold provides aircraft operators with far more severe problems than does extreme heat

were removed and put in a tunnel under the wings of one of the airplanes, and the tail was set up on a box so that the ship was in a flying position. A snow wall was then constructed from the surface to the bottom of the fuselage and wings. The work on the motor was just the usual twenty-hour check, and no further work was needed. It was thought inadvisable to use rubber in the mountings. Asbestos lining was installed before leaving the States; however, this was replaced by a regular rubber mounting washer during this period.

In August the blades and tail surfaces were installed on the Autogiro in temperature of 60 to 67 degrees below zero Fahrenheit. Specially constructed tents were placed over the tail and around the rotor head so that heat could be applied before tightening up and safetying the various nuts, bolts and clevis pins. The motor was started and the blades revved up and tested in a temperature of 62 degrees below zero and found to work satisfactorily and normally.

During the month of September ten meteorological flights were made; the coldest temperature flown in was 57 degrees below zero and the warmest was 41 below. In preparing for flight in these sub-zero temperatures it would take from one and one-half hours to two hours to thaw-out the motor sufficiently, using two very powerful Van Praag blow torches inside the windproof tent.

Quick Getaway

The front ski of the Autogiro were almost always about two feet under the surface, so that it was approximately in a flying position, and the controls and blades were individually secured to small planks of wood sunk four feet in the snow. After the securing lines were all taken off and the snow shovelled from the ski, the ramp shovelled to the surface and the motor started, it was necessary to keep it turning at about 1,000 to 1,200 revs and to get in the air as quickly as possible, otherwise the motor and oil would both cool off very rapidly, which meant a possibility of motor failure during the take-off.

Due to the fact that the motor had to be run so fast to keep from cooling, the clutch was not used in starting the blades: each take-off was a taxi-off. The rotor head, upper starter unit and dampers were not heated prior to a flight.

After a flight the Autogiro was taxied to the pit, oil drained, snow shovelled on the ski, and the blades and all the control surfaces secured so that in blizzards there would be no danger of it being blown away. In this manner the machine weathered temperature of 73 degrees below zero Fahrenheit and winds as high as 60 m.p.h.

On September 28 I taxied down the barrier in the usual manner for a take-off on the tenth meteorological flight. Upon leaving the snow I knew there was something radically wrong. The nose of the ship wanted to go right

up, this causing a whipstall. With the motor wide open it took all my strength to hold the stick as far forward as it would go, thus managing to keep from whipstalling. In this manner I struggled along until about a hundred feet of altitude was obtained. At this point there was quite a strong wind, which was very helpful in getting the nose down and turning round; then another turn for landing. In the meantime it had begun clouding up as though getting ready for a blow. To get back to the surface I still had to keep the motor wide open and the stick all the way forward. In attempting to land, the motor could not be slowed down at all, because, as was said before, the ship would have been whipstalled. Nevertheless, when back

near the surface the nose came up, and nothing could be done about it. The result was a whipstall at about a hundred feet. Seeing that a crash was inevitable, I cut the switch. The Giro fell off to the left, landing on the left wing and tail.

After investigation, the crash was found to be due to the fact that snow had drifted in the tail-end of the fuselage, resulting in the tail-heaviness.

Up to the flight of September 17, including three months' operation the preceding Fall, there had been drifts with winds as high as 50 m.p.h. The Autogiro was on the surface during all this drift and had taken no snow inside at all.

ALL in the DAY'S WORK

Some Varied Incidents in the Duties of R.A.F. Squadrons Overseas

THE daily newspapers give but little news of the work of R.A.F. squadrons overseas, for their business is rarely sensational enough to attract the notice of Press correspondents. Yet their doings are full of interest, and adventure is accepted as a normal part of the day's work. Very rarely has "air action" to be taken, and things on the ground have to reach a pretty bad pass before a single bomb is dropped. But watch and ward over the deserts and the mountains goes on unceasingly. Not a little blood would be spilt in obscure tribal frays if the R.A.F. squadrons were to be withdrawn. It is the possibility of "police bombing" which quells the ardour of raiders and rebels, and so saves life.

The Aden hinterland is always a likely scene of strife, and before the days of air power there was little which Britain could do to prevent the fighting. Air Commodore Portal, D.S.O., M.C., the A.O.C. Aden Command, has at his disposal No. 8 (Bomber) Squadron, equipped with the Vincent aeroplane, a section of R.A.F. armoured cars, some Protectorate Levies, and some regular military units which are intended for the defence of Aden against attack from the sea. For effective control of the tribes in the hinterland he depends mainly on No. 8 B.S. The following are typical instances of the sort of thing which is constantly going on in the hinterland. Last summer the Acting Resident received a most impertinent letter from a certain petty sheikh in which the writer threatened to fire on any aircraft which might presume to fly over his territory. It is usually those who want to disturb the peace who object to the sight of the guardians of the police, and it was a fair inference that this sheikh was cogitating mischief. He was ordered to come and explain his conduct. Meanwhile a strip mosaic of his village and surrounding parts was made, so that if air action should become necessary it would be easy to identify the guilty party. However, the sheikh's heart failed him, and he persuaded the head sheikh of the tribe to which he belonged to come in with him and put forward a suitable apology.

Persuasion

Two sections of another tribe had always resented an agreement made with the authorities to respect the inviolability of the trade routes, and they combined to attack a caravan, and killed and wounded six travellers. The Sultan of their tribe was ordered to collect a heavy fine from the guilty sections and to take hostages from them. At first he disregarded the order, for raiding and plunder, in which murder is a scarcely regrettable incident, seem a sacred right to some of these tribes. So an ultimatum was sent direct to the raiders to say that, unless the fine and hostages were sent in by a certain date, No. 8 B.S. would pay them a visit and talk to them in language which they



Fairey III F's of No. 45 (B) Squadron over the Pyramids.

could not fail to understand. They came in and paid up.

Sometimes the patrols find trouble and settle it without even knowing that any was brewing. Another tribe had looted some camels from traders from the Yemen, when two Vincents happened to fly over them on patrol. The airmen knew nothing about the raid, but the conscience-stricken raiders thought that vengeance was about to overtake them. Hastily they went to the Sharif who ruled over all their tribe, and begged him to take the loot and restore it to its owners. This was done, and the Yemini merchants doubtless feel due gratitude to the Royal Air Force.

In the very same week as the above incident, a local Sultan was very properly trying to restore peace among some of his tribesmen who were quarrelling and perhaps had already come to blows. The Sultan was not finding it an easy matter, when by chance two Vincents landed at the headquarters of the district on a visit. The mere sight of them immediately strengthened the Sultan's hand, and the recalcitrant tribesmen forthwith accepted his terms.

Flights of Mercy

Flights of mercy are almost as common as flights to preserve the peace. The Sharif who restored the Yemini camels was taken ill about the time of that incident, and a medical officer flew out to attend to him. He completely recovered. On another occasion an Arab boy with a badly diseased leg was brought in to hospital at Aden. Again, a firm of Indian merchants grew anxious over the non-appearance at Berbera of a steamer carrying passengers and goods, and asked for the help of No. 8 B.S. The steamer was found, late, but on its way.

From India come similar stories of mercy flights. Kashmir is a wild country in the mountains beyond Gilgit, and last summer it was afflicted with an outbreak of bubonic plague. A supply of plague vaccine was straightway flown up to Gilgit in two aeroplanes. A training flight to Gilgit has several times been undertaken by the Hart wing (Nos. 11 and 39 B.S.), but the journey involves crossing tremendous mountains where no forced landing grounds

need be looked for, and airmen must just trust to their Rolls-Royce Kestrels. Still, there was no hesitation in hurrying up the plague vaccine, and history does not relate how many hundreds of lives were thereby undoubtedly saved.

An unusual story concerns a Dutch official in Sumatra who fell dangerously ill. One would have imagined that surgeons could have been procured from elsewhere in the Dutch colonies, but a request was made for surgeons from India. Two were at once flown down in a flying boat (presumably supplied by No. 205 F.B.S. at Singapore) and the official was operated upon, but the result is not on record.

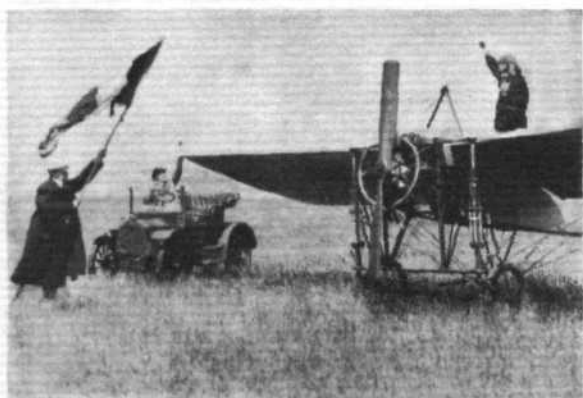
During August No. 45 (Bomber) Squadron at Helwan was asked to look for an Italian Savoia Marchetti machine which was missing. Five Fairey III F machines set out on the mercy flight, but what they found was the burnt-out wreckage of the machine near Almaza.

No. 84 B.S. at Shaibah, near Basra, were given a mission which sounds unusual, but may be necessary at any time in desert country. A party of police were out in the desert and had run short of water—the most terrible thing which can happen to desert travellers. A Vincent was sent out to the party and dropped a water supply by parachute. One may imagine that rarely has the sight of a bomber in the sky been more welcome to human eyes.

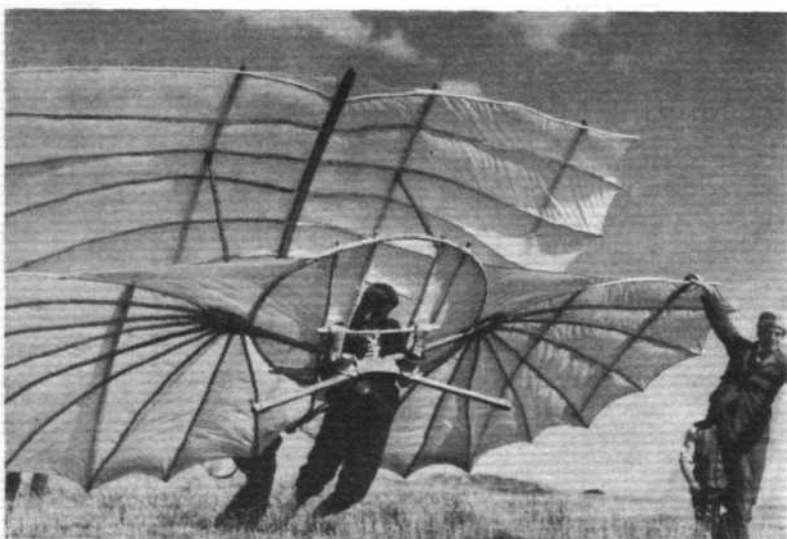
The above are a few incidents, but all the time the patrols go out and watch to see that all is well in all the Eastern Commands, and every year the flying boats from Basra and Singapore fly across the seas, patrolling, mapping, looking for moorings and choosing aerodromes for land-planes, conveying Residents and Governors about the world, and in their spare time looking for slaving and gun-running dhows. Thus is the Pax Britannica kept more strictly than was possible before the coming of the Royal Air Force.

AN AMBITIOUS FILM EFFORT

Some Scenes from a Historical Review of Aviation, "Conquest of the Air," Now Being Made by London Film Productions



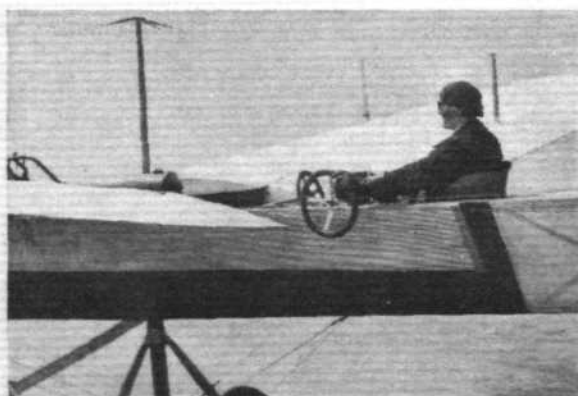
(Above) Bleriot sets off on his Channel flight. The machine is the still airworthy Bleriot which occasionally flies in France. An apparently unavoidable departure from strict accuracy is that the Anzani engine is not a three-cylinder of the type used on the memorable flight.



Another impressive and—presumably—realistic scene from *Conquest of the Air*: Otto Lilienthal's glider experiments, which, after considerable success, caused his death in 1896.



Percy Marmont as Wilbur Wright, and Charles Hickman as Orville. The machine, which is an exact replica of the Wright biplane, was specially built for the film company by Zander and Weyl, the well-known sailplane constructors of Dunstable.



Hubert Latham, who was narrowly beaten by Bleriot for the honour of making the first Channel crossing, at the wheel of his Antoinette monoplane, as played in the film by Roy Royston.

SOLO SOUTH-WEST

Miss Jean Batten's Courageous Effort : Fresh Laurels for the Gull and Gipsy Six

MISS JEAN BATTEN has done it. To summarise her achievement, she is the first woman to fly the South Atlantic Ocean, she has made the fastest time for a solo crossing, and the fastest trip from England to South America. Her time for the over-water portion was 13h. 15m., which is 3½h. better than that of Señor Pombo, who, last May, made the journey in a B.A. Eagle with a 130 h.p. Gipsy Major engine. Miss Batten was flying a Percival Gull with the 200 h.p. Gipsy Six.

Leaving Lympne at 6.30 a.m. on Monday, November 11, she reached Casablanca at 4.15 p.m. the same day. At 5.30 a.m. on the Tuesday she pushed on to Villa Cisneros, where she refuelled her Gull, and took off again at 1.30 p.m. for Thies, near Dakar, French West Africa, arriving at 8 p.m. Next day she set out on the sea crossing, intending to fly low and to make it in twelve hours. Actually, as already stated, she took 1½h. longer. On arriving at Port Natal, Brazil, she is reported to have said that she was "not particularly tired."

Rio Bound

On the morning of November 14 Miss Batten left Port Natal for Rio de Janeiro, but by 7.50 in the evening had not arrived. A military aeroplane was despatched to search for her near the city, and the Pan-American *Porto Rican Clipper* was ordered to make a detour and to try to locate her.

On Friday she turned up at Rio, explaining that she had forced-landed in a swamp near Araruama, a coastal town 175 miles to the north-east. In taxiing to what she thought was a safer position the airscrew struck a heap of sand and bent itself, making a take-off impossible, so she telephoned Rio to say that she was safe, spent the night in a fisherman's hut, and was taken next day to Rio by a military machine. Later, she flew back with a mechanic to



Miss Batten at the cabin window of the Gull.

inspect her Gull, but, finding that repairs were impossible on the spot, returned to stay at the British Embassy.

It is reported that the Brazilian Congress has passed a resolution congratulating Miss Batten, and that the newspapers have devoted more space to her flight than to the Abyssinian affair. Apparently it is her intention to fly on soon to Buenos Aires.

The Air Ministry announces that Sir Philip Cunliffe-Lister, Secretary of State for Air, has sent the following message to Miss Batten at Rio de Janeiro: "Very hearty congratulations on your splendid flight."

Contributory factors to Miss Batten's success were: Wakefield Patent Castrol; K.L.G. plugs; Palmer wheels, tyres and brakes; Claudel Hobson carburetter; Auto-Klean filters; Smith's Instruments; Titanine dope; B.T.H. magnetos; and Weyburn camshaft.

Forthcoming Events

Club Secretaries and others are invited to send particulars of important fixtures for inclusion in the list.

- Nov. 21. R.Ae.S. (Coventry Section) Lecture: "Carburation and Engine Controls," by Lt. H. Cantrill, 8 p.m., Armstrong Siddeley Canteen.
- Nov. 29. Yorkshire Aeroplane Club. Annual Ball, Hotel Majestic, Harrogate.
- Dec. 2. R.Ae.S. Lecture: "Undercarriage Design," by G. H. Dowty, 6 p.m., Institution of Electrical Engineers.
- Dec. 3. Chelsea Colleges of Automobile and Aeronautical Engineering. Dinner Dance. Grosvenor House.
- Dec. 6. Hampshire Aeroplane Club: Tenth Annual Dinner and Dance, South Western Hotel, Southampton.
- Dec. 6. Contractors' Dinner, Martlesham Heath.
- Dec. 16. R.Ae.S. Lecture: "Wireless and its Application to Commercial Aviation," by Capt. J. M. Furnival, 6 p.m. Institution of Electrical Engineers.
- Dec. 19. R.Ae.S. (Coventry Section) Lecture: "The Stratosphere," by Capt. J. Lawrence Pritchard, 8 p.m. Armstrong Siddeley Canteen.
- Dec. 20. London Aeroplane Club. Annual Ball, Park Lane Hotel, London.
- 1936.
- Jan. 16. R.Ae.S. (Coventry Section) Lecture: "Development in Centrifugally Cast Piston Rings for Modern Aero Engines," by Mr. P. R. Twigger, 8 p.m., Armstrong Siddeley Canteen.

- Jan. 22. Royal United Service Institution Lecture: "The Expansion of the Royal Air Force," by Air Marshal Sir C. L. N. Newall, at 3 p.m.
- Jan. 30 and 31. Aerodrome Owners Association: Annual Conference and Aerodrome Equipment Exhibition, British Industries House, Marble Arch, London.
- Feb. 20. R.Ae.S. (Coventry Section) Lecture: "Variable-pitch Propellers," by Mr. T. E. Beacham, 8 p.m., Armstrong Siddeley Canteen.
- Feb. 28. Bristol and Wessex Aeroplane Club: Annual Aviation Ball.
- Mar. 10. Royal United Service Institution Lecture: "The Development of Civil Aviation," by Lt. Col. F. C. Sheldermine, at 3 p.m.
- Mar. 19. R.Ae.S. (Coventry Section) Lecture: "Type-Testing an Aircraft," by Flt. Lt. Bulman, 8 p.m. Armstrong Siddeley Canteen.
- April 16. R.Ae.S. (Coventry Section) Lecture: "Aircraft Instruments," by Mr. J. E. Chorlton, 8 p.m. Armstrong Siddeley Canteen.
- May 15—June 1. Stockholm Aero Show.

Private Flying



Topics of the Day

New Standards

LOOKING like a cross between a deep-sea diver and a Polar bear and feeling sometimes like a disembodied spirit, the private owner of the bad old days tolerated anything. The exhaust noise was muffled by a helmet; the unruly buffetings of a badly arranged slipstream were lost in the folds of a scarf of unlimited length; and the sometimes inordinate vibrations at certain throttle openings were treated with contempt by one so encompassed in clothing that nothing short of a broken airscrew would be really noticed.

When, during the short English summer, one occasionally took the air in hatless, coatless and gloveless state, the several discomforts of the early light aeroplane became more obvious. The arrival of the cabin aeroplane brought matters to a head.

Obviously, a prospective owner who was accustomed to travelling in the silken silence of an expensive automobile would not readily tolerate a vehicle in which the standards of internal luxury and of silence were appreciably lower. For the sake of the additional speed he might sacrifice something, but not too much. To appeal to the kind of man who can afford it, a private machine must be both luxurious in appearance and reasonably silent.

Noises Off

ALTHOUGH, in discussing the relative quietness of different machines, one usually thinks quite automatically in terms of engine noise, I think that the most annoying and difficult sounds are those connected with the airflow generally.

One has only to apply the air brakes on a Puss Moth, for instance, to realise the extent to which eddying can affect a reasonably quiet cabin machine. Cleanness, therefore, is one way towards silence.

Then, of course, everything in the machine that is liable to vibrate at different throttle openings must be attended to. I once flew an ancient cabin aeroplane in which the dithering of dashboard fittings and the like always gave me a temporary headache on flights lasting for more than half an hour.

I hear that Mr. Rumbold's work on Air Hire's new Eagle has made such a difference to a machine which was already quiet that the British Aircraft Company is standardising the Rumboldisation on all future models.

The Heston Phoenix, too, sets a new standard in single-engined aeroplanes. While flying in this machine last week I found that one could talk comfortably without raising one's voice, even at full throttle and when in a power glide at 170 m.p.h. The curious thing is that speed makes very little difference to the degree of silence—a fact which alone suggests that the Phoenix is remarkably clean in its detail work.

Wind Direction

HOWEVER efficient a novice may be in his spot-landing approaches at the home aerodrome, he usually goes to pieces when he first attempts the real thing in the way of forced landings with a sometimes querulous instructor. Quite apart from the facts that fields look so very small and that a good one must be found within fifteen or thirty seconds of throttling back, the problem of wind direction can be very worrying indeed while in open country.

Obviously, it is impossible, unless the sun is shining fairly low in the heavens, to keep track of one's direction during climbing turns and hearty arguments with the instructor while flying over a stretch of country which looks for all the world like a green chessboard. Useful jets of smoke may be as scarce as windsocks, and cows do not necessarily graze head into wind—as I discovered to my sorrow during preliminary forced landing instruction.

Provided that the machine is flying fairly accurately into wind in the first place, it is possible to make adjustments during the final glide in by simply watching the green passage of the earth below, and in strong winds there can rarely be any doubt.

A Useful Trick

NEVERTHELESS, full of the ingenuity of the examinee who is determined to pass by fair means or foul, I devised a perfectly simple scheme which has since relieved my mind of quite a load on ordinary cross-country flights.

As soon as I had turned the machine into wind on the aerodrome I released the verge ring on the compass and turned it until the north indication was against the north finding end of the needle.

Thereafter, whenever I was in doubt, I simply turned the machine until the needle was parallel with the grid wires, and studied the landscape anew with the pleasant knowledge that the machine was then facing into wind. Any manoeuvres on the way into a field were then made with a fixed knowledge of the lie of the land. It is a curious fact that, having once visualised a stretch of country from one particular angle, it appears to be perfectly easy to orientate oneself again after any number of turns. Fields which to the layman appear identical are easily distinguishable to the pilot with forced landing experience.

Before setting off on a cross-country flight I always memorise the approximate position of the compass needle just before opening up for the take-off, so that, if the worst comes to the worst, and if the wind direction does not change too much, I can always turn the machine into wind for an examination of likely fields.

This system has been useful, too, when practising cloud flying, enabling me to fly upwind and downwind for certain periods of time in order to emerge again over the aerodrome.

INDICATOR.

FROM the CLUBS

Events and Activity at the Clubs and Schools

LIVERPOOL

Machines of the Liverpool and District Aero Club flew 86 hr. 35 min. during the fortnight ended November 15. A dance will be held in the Hooton clubhouse on Saturday, November 30, starting at 7.30.

CARDIFF

Mr. Rogers brought over a B.A. Eagle for a demonstration the other day. Members who flew it found it a most agreeable aeroplane. During the week ending November 11 the club did 15 hr. flying.

YORKSHIRE

A *Pou* which is being tested at Yeadon is arousing great interest. Flying time last week, during which four new members joined, totalled about 16½ hr., several days being too foggy for flying. The new members are Mr. and Mrs. H. Williamson, Mr. Charles F. R. Brotherton, J.P., and Mr. R. A. Vinter. A first solo has been made by Mr. C. H. Barker, an Air League pupil.

BRISTOL

By arrangement with the Bristol and Wessex Aeroplane Club, seventy members of the Bristol Branch of the Royal Aeronautical Society visited the Airport on Saturday. Short flights in two Western Airways' Dragons were followed by an inspection of the Airport and tea in the Clubhouse.

On returning from his "Summer" holiday on November 19 Mr. E. M. H. Slade, the club instructor, found plenty of work waiting for him, as instruction had been suspended during his absence. The annual Christmas party will be held in the clubhouse on Thursday, December 19.

READING

During the bright periods last week some 23 hr. were flown, and seventeen pupils were given instruction.

Flt. Lt. R. Milne, who of late has been giving instruction single-handed, now has F/O. L. E. Dalrymple to assist him. Mr. Carr made his first solo last week. Mr. Hans G. Lund, who is an instructor with the Widerøes Flying Company in Norway, spent the week-end at the club. He is to take an instructor's course with A.S.T.

Weather permitting, the club will compete next Sunday against Brooklands in a landing competition. The event will take place at Brooklands, as this club is the present holder of the "Challenge Cup"—a somewhat battered pint tankard.

HESTON

Herr Theodor Blaich, a German owner of plantations in West Africa, has had a refresher course and took a British "A" licence with the Airwork School last week. He has bought a small Junkers monoplane and is fitting it with floats and shipping it to West Africa. The arrival of Herr Blaich was, indeed, a signal for the weather to improve, and it has been exceptionally good for flying all last week.

Mr. R. W. Gropler, who recently purchased a Klemm by cable from Australia, has now arrived in England to collect the machine from Airwork sales department. He is a pilot of under 100 hours' experience, but intends to fly the Klemm back to Australia himself after a few preliminary trials in England. He will probably be leaving early in December.

LONDON

On the four fine flying days last week, the London Aeroplane Club did 61 hr. 15 min. flying.

Mr. Buchanan and Mr. Morrison made some long cross-countries to a number of aerodromes.

REDHILL

Four blind flying certificates were issued last week, and Miss E. Stone, and Messrs. Dumbleton and Huxley went solo. Mr. L. J. M. White took his R/T licence.

Flying time totalled 43 hr. 5 min.

SALISBURY

Twenty-and-a-quarter hours' flying was recorded by the Wiltshire School of Flying at High Post aerodrome last week.

General H. Massey, R.A., obtained his "A" licence, and Messrs. Temple West and White became pupils. The Aeronca was demonstrated.

The machines in action were three Moths (one equipped for blind flying instruction) and one Redwing.

CAMBRIDGE

During the early part of last week the Club experienced good weather and on several occasions had as many as five school machines in the air at once. The weather during the latter part of the week, however, seriously interfered with flying, but despite this, last week was a record one for the number of new members joining and the number of first solos.

Actually, there were six new members and five soloists.

HANWORTH

Last week's big event, of course, was the return of F/O. D. W. Llewellyn and Mrs. Jill Wyndham from the Cape.

A new Gipsy 11 Moth is being "re-C. of A'd" and will be brought into the School's fleet almost immediately. Mr. Moller is keeping his C.30 Autogiro in the club hangar. A new Jubilee Monospar is the latest addition to the club's fleet and is available for charter work and instruction.

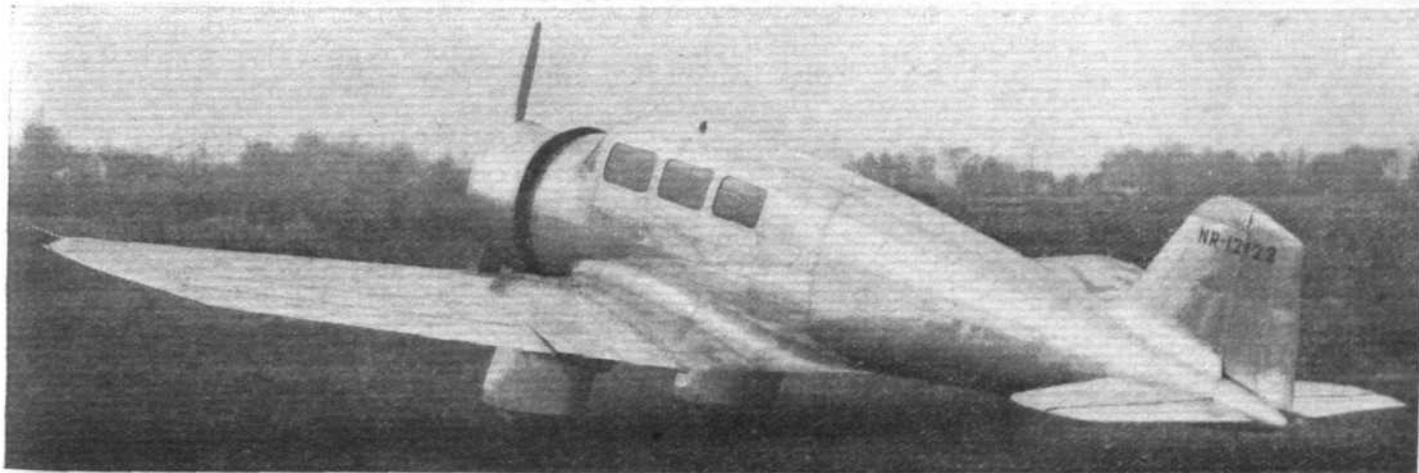
Last week's flying hours were greatly increased by members of the National League of Airmen, who are taking advantage of the N.L.A. flying scheme. Messrs. Wright, Heath and Williams became members last week. The next dinner and dance at the Hanworth Country Club will be on November 29.

CINQUE PORTS

Wintry weather impeded tuition last week, but 23 hr. flying was registered for the week ending on Thursday.

Several members are taking courses of instrument flying. Mr. Doig has had a spill with his *Pou*. It developed a left-wing-low tendency, and proceeded to slow-roll on to the ground. The wind put it on its back, but Mr. Doig stepped out intact. It should be flying again soon.

On Armistice day the club fleet and staff paraded for the Remembrance service. Last week's visitors included Sir Philip Sassoon, Mr. Hugh Buckingham, on his way to Finland in a D.H. Rapide, and Mr. Wynne-Eaton and Mr. Trelawney in a Hornet. Mr. Valetta collected a passenger from the Small Arms School and flew him in Brooklands Air Taxis' Leopard to Gloucester. Mr. Morris and Mr. De Pury flew over to Paris on Saturday.



IMPROVING THE BREED: An experimental Stinson, suitable, it would appear, for wealthy private owners in a hurry and for charter work. As will be gathered from an inspection of the picture, stressed metal skin is used. The engine is a Wright Whirlwind.

Private Flying

C.A.S.C.

On Monday, November 11, 1 hr. 30 min. flying was put in by three members. Mr. Molyneux went solo. Fourteen members attended on Sunday, but only six of them were able to fly owing to the weather. They put in 2 hr. 5 min. Mr. G. W. Walker has left the instructional staff.

KARACHI

The four machines of the Karachi Aero Co., Ltd., flew 212 hr. 25 min. during October. No less than 30 hours night flying were recorded.

Messrs. Manda and Nand Kishore obtained their "A" licences, and Mr. Khuller took his ground engineer's "C" licence.

PORTSMOUTH

The floods, which have been prevalent everywhere, have affected even Portsmouth airport, and this fact, coupled with the prevailing bad weather, severely curtailed the flying by the Portsmouth Aero Club last week. Actually, the times totalled 24 hr. 45 min., of which 14 hr. 50 min. was solo.

Mr. Papps took one machine to Heston on Tuesday and Mr. Errington took another to Croydon on Friday. The club, incidentally, has purchased another Gipsy I Moth and now has the use, subject to certain reservations, of Sir Charles Rose's latest acquisition, a Puss Moth. Mr. Guard has taken delivery of his Hornet Moth.

New members include Messrs. Reed, Lane and Sadler, and Mr. W. N. Davis has qualified for his "A" licence.

BROOKLANDS

A large area on the north-east corner is being added to the landing area.

The dinner and dance last Saturday week was attended by 150 members and guests.

New members include Mr. Fermor Hesketh, of the Scots Guards, and Flt. Lt. Duke of Yaxton, who is taking a course of instrument flying. Capt. Max Findlay has been busy putting various Guild members through instructor's instrument flying courses for various new Reserve School appointments. Mr. Taylor-Young has bought a Puss Moth, Dr. Ridsdell a Gipsy II Moth, and Miss Betty Malcolm a Leopard, the latter being fitted with the latest homing device. Mr. Hans G. Lund, from Norway, paid the Club a visit. Mr. E. Allott is on duty again, having completed his Reserve Training at Sywell.

Hampshire Changes

MR. K. C. WINTON has been appointed as chief instructor of the Hampshire Aeroplane Club in succession to Mr. W. H. Dudley, who has left to take up an appointment as instructor with the Phillips and Powis Reserve School at Reading, after being with the club for seven years.

Mr. Winton has been with the club since May, 1932. His C.F.S. category is A1, and he is also the club's Air Ministry approved blind flying instructor.

The Instructional Tourists Return

THE return journey of the Bombay-Heston flight, organised by the Bombay Flying Club, was completed according to schedule when the three machines landed at Juhu (Bombay) aerodrome on September 29.

On landing at Bombay Mr. Gazdar, the leader, said that all the machines behaved well throughout the trip and that no difficulties were experienced. Next year he hoped to take thirty machines for the flight and would invite people from all parts of India to take part.

Manchester Pou Club

THERE are now some fifty members of the Manchester Challenge Flying Flea Club, whose secretary is Mr. R. V. Sims, of 23, Eskrigge Street, Hr. Broughton, Salford, Lancs. Their first Pou is to be fitted with a modified 600 c.c. Douglas motor cycle engine.

Navigation in Brief

Practical Air Navigation. By Wing Comdr. J. K. Sumners, M.C., R.A.F. (Sir Isaac Pitman and Sons, Ltd. 2s. 6d.)

IF we had been asked whether it was possible to deal adequately with all the problems of navigation, from the ground upwards, so to speak, in a handbook covering only fifty-seven comparatively small pages, we should have doubted it. However, Wing Comdr. Sumners has done it—and done it very well indeed.

Probably the absolute ignoramus would have a little difficulty in keeping pace with the flow of information, but the pilot or interested person who already has a little idea of things will find that all his knowledge, and a great deal more, has been neatly condensed.

In the circumstances, however, we feel that various aspects of rule of thumb navigation—concerning, for instance, the discouragement of the natural idiosyncrasies of the compass—might have been expanded at the expense of the more advanced problems which are covered. Nevertheless, these more advanced points are dealt with in such a clear and simple manner that we should be loth to criticise the fact of their inclusion in such a book.

Useful Work

ALTHOUGH formed only a few months ago, the Federation of British Gliding Clubs has already achieved practical results.

The conditions for claiming the Government grant, for instance, while reasonable enough in theory, are somewhat exclusive in practice. Some clubs found themselves faced with the demand that their proposed new hangars should be erected and certified by the local authority before a claim for the grant could be considered. They at once realised that they were in danger of insolvency, and the Federation took action. A strong protest was made to the distributing organisation through one of the leading clubs. Before incurring any expenditure clubs may now secure a certificate for approved proposals to the effect that the grant will be paid when the work is completed.

Another matter of great interest to clubs claiming the grant concerns the qualifying condition of registration as a limited liability company. The Federation has consulted the Registrar of Friendly Societies with the idea of simplifying the procedure, and the proposals are due for ratification at the next meeting. If carried into effect the cost of registration will be reduced by some £8 per club. A third qualifying condition demands the use of a soaring site. These are few and far between, but the Federation has worked out a scheme whereby clubs which can train up to "A" and "B" standards can now share the soaring facilities of clubs that are more fortunate in this respect and thus train their own "C" pilots. The address of the Secretary of the F.B.G.C. is Lady Place, Sutton Courtenay, Berkshire.



A SPECIAL HORNET: Mr. W. Lindsay Everard's new D.H. Hornet is fitted with a Reid and Sigrist Gyrogon, a drift sight and an extra locker. The colour scheme, as in the case of his previous machines, is blue and red with red leather upholstery. (Flight photograph).

12048³

THE ROYAL AIR FORCE

SERVICE NOTES AND NEWS

AIR MINISTRY ANNOUNCEMENTS



HIGH ASPECT RATIO is but one of the numerous outstanding features to be found in the new Vickers Wellesley medium bomber which has been ordered in quantity for the R.A.F. This machine made its first public appearance at the S.B.A.C. Display this year. The engine in the prototype is a Bristol Pegasus III 690/750 h.p. radial, but the production machines, it is now stated, will have a new type of Pegasus designated the Mk.XVIII. With full load the machine weighs about 10,000 lb.

R.A.F. AND R.A.A.F.

Air Comdre. S. J. Goble, Royal Australian Air Force, is coming to Britain for a period of service with the R.A.F., in exchange with Air Comdre. H. R. Nicholl, R.A.F., who is going to Australia for duty with the R.A.A.F. Air Comdre. Goble is well known in this country as he was Liaison Officer at the Air Ministry some years ago.

DRESS REGULATIONS

A list of amendments to the Dress Regulations for the R.A.F. has been issued by H.M. Stationery Office. The price is 3d.

UNIVERSITY AIR SQUADRONS

A second edition of the Regulations for University Air Squadrons (Air Publication 1401) has been issued at the price of 4d. It can be obtained from H.M. Stationery Office or through any bookseller.

INTERNATIONAL MATCH TICKETS

Officers and men of the R.A.F. who desire tickets for the Association football match between England and Scotland at Wembley on April 4 should apply to Flt. Lt. W. R. Worstall, Home Aircraft Depot, Henlow Camp, Beds. Prices are from 2s. 6d. to one guinea. Payment for the tickets will be asked for later.

C.F.S. REUNION DINNER

A reunion dinner of officers, past and present, of the Central Flying School, will be held at the Dorchester Hotel, Park Lane, London, W.1, on Friday, November 29, 1935. Officers who have at any time served on the staff of the School are eligible to be present. Invitations are also extended to those pupils who attended courses from the inauguration of the School until the end of the Great War. Particulars can be obtained from the Hon. Secretary, C.F.S. Dinner, Central Flying School, Upavon, Marlborough, Wilts.

THE ABINGDON COLLISION

Verdicts of "Accidental Death" were returned at an inquest at Abingdon, Berks, on November 11, on the bodies of F/O. Alexander Ross, a native of Sutherland, his passenger, L.A/C. J. Waugh, who came from Northumberland, and Sgt. Pilot William Park, whose home was in Vancouver, British Columbia, who were killed when two R.A.F. machines came into collision above Abingdon aerodrome.

Flt. Lt. A. A. Jones said that they had flown to Cardington on Saturday to fetch three new machines. On the return journey the three new machines, one piloted by Ross, were flying in front, and he gave the signal to break formation. He saw Ross climb to the right, but nothing else.

Sqn. Ldr. A. P. Ledger, who was standing on the aerodrome, said that he thought Ross's view might have been obscured by a wing in turning, and that he did not see Park's machine. The occupants had parachuted, but probably the force of the impact stunned them.

PEGASUS X FOR THE SERVICE

The Pegasus X engine, manufactured by the Bristol Aeroplane Co., Ltd., is being introduced into the Service. It is of the air-cooled radial, 9 cylinder, single row type, moderately supercharged, and follows the general lines of design of the Pegasus III engine but develops a greater power. The fuel for this engine is to Specification D.T.D.230 (87 octane value). The rating and other particulars are as follows:—

B.H.P.—790/820 at 3,500 ft. at 2,250 r.p.m.
Compression ratio—6.55 to 1.

FORMATION OF R.A.F. POLO ASSOCIATION

At a meeting held at the Air Ministry on October 8 the R.A.F. Sports Board approved the formation of a R.A.F. Polo Association to take effect from the date of this order. Full details concerning the association will appear in the R.A.F. Athletic and Games Handbook, 1936, copies of which will be distributed as usual to all units during the first week of January, 1936. Preliminary details can be obtained on application to the Hon. Secretary, R.A.F. Polo Association, Halton Camp, Bucks.

ELECTRICAL AND WIRELESS DINNER

The reunion dinner of officers of the Electrical and Wireless School (Farnborough, Flowerdown, and Cranwell) will be held at the Royal Air Force Club, 128, Piccadilly, W.1, on Saturday, January 11th, 1936, at 7 for 7.30 p.m. On account of the death of Mr. J. F. Herd, the secretary, many addresses of members have gone astray, but full details may be obtained from Flt. Lt. F. S. Wainscot, the Electrical and Wireless School, Royal Air Force, Cranwell, Lincs.

LONG SERVICE AND GOOD CONDUCT MEDAL

The Long Service and Good Conduct Medal has been awarded to the undermentioned airmen:—

W.O.s Hibbins, A., M.M., Sims, A. E., W.O.s Peyton, A., Scott, N.; Flt. Sgts. Banfield, W. G., Canton, W. G., Cole, E. J., Francis, R. A., Giles, C. F., Goodridge, J. W., Kirlham, D., Meech, H. S. H., Monk, W. S., M.M., Myles, H., A.F.M., Newman, F. W., Ramsay, J. B., Searle, E. T., Short, R. W., Syzling, W. H. C., Wade, A., Ward, A. C., Weiss, F. M., Williams, E. E. K.; Sgts. Allen, D. F., M.M., Cope, W., Copestake, J. R., Coyne, J. A., Crosland, W., Dunn, F. L., Edwards, D., Garland, T. H. G., Geen, C. O., Johnson, J., Johnson, R. F., Keane, E. M., McIndoe, J., M.M., Payne, A. A., Wilson, R. E., Wiltcher, G. R., Woodcock, J. W., Cpls. Buckle, T. W. C., Coleman, S. R.; Cpl./A./Sgt. Evans, R. J.; Cpls. Greenfield, A. D., Hughes, J., Kettle, G. H., Platt, T. H.; Cpl./A./Sgt. Spiteri, S. S.; Cpls. Tucker, G., Weedon, A. E.

ROYAL AIR FORCE GAZETTE

*London Gazette, November 12, 1935**General Duties Branch*

The following are granted short service commissions as Acting Pilot Officers on probation with effect from and with seniority of October 21:—A. D. Annand, B. Bell, W. H. Biddell, R. N. Brett, E. J. Brooks, C. B. E. Burt-Andrews, J. Butterworth, P. D. D. Carlton, N. A. F. Cheesman, G. C. N. Close, J. Compton, P. E. G. G. Connolly, G. I. L. Corder, J. L. Crisp, B. E. Dobb, M. W. Donaldson, C. E. Drapper, G. D. Evers, I. A. Fergusson, T. E. J. Fitton, J. W. S. Forbes, H. J. Garlick, M. A. L. Scudamore, Giles, A. J. Goldie, A. R. L. Griffiths, N. D. Guthrie, P. Hadfield, A. Hibbler, H. A. Hornblow, G. C. Hyde, N. T. Ingham, J. H. Irvin, E. O. Jones, D. Kain, M. W. B. Knight, L. S. Lawrence, W. G. Lockhart, J. H. Magnus, H. C. Maudslay, D. I. McLeod, M. C. F. Mee, T. F. D. Morgan, P. A. B. Neel, J. P. Owens, L. V. E. Petley, G. H. F. Plinston, D. D. Rawlins, P. H. Rebbeck, W. Riley, A. J. Robinson, A. V. Rogers, F. E. Rosier, B. J. Sandeman, J. MacL. H. Sinclair, J. E. J. Sing, J. P. S. Smyth, H. W. Tennant, F. W. Thomas, A. C. R. Thompson, J. S. Tupholme, P. R. Walker, J. T. Webster, R. K. Wildey, Y. P. Wilson, A. L. Womersley.

E. Rosslyn-Stuart is granted a short service commission as Acting Pilot Officer on probation with effect from and with seniority of October 22; Lt. A. J. W. Geddes (Royal Artillery) is granted a temporary commission as a Flying Officer on being re-seconded to the Royal Air Force with effect from October 19 and with seniority of October 19, 1931.

The following Pilot Officers are promoted to the rank of Flying Officer:—R. H. S. McConnell (September 3); D. C. Oliver (September 11); E. H. P. Clarke (September 24); F. Rump (October 3); S. T. Misselbrook, F. M. Loudon (October 24).

Sqn. Ldr. R. P. M. Whitham, O.B.E., M.C., is granted the acting rank of Wing Commander (unpaid) with effect from November 12, while appointed to the directing staff of the R.A.F. Staff College.

Medical Branch

Sqn. Ldr. (Quartermaster) W. Gamblen is placed on the retired list (November 9).

ROYAL AIR FORCE INTELLIGENCE

Appointments.—The following appointments in the Royal Air Force are notified:—

General Duties Branch

Group Captain.—F. L. Robinson, D.S.O., M.C., D.F.C., A.D.C., to No. 2 Flying Training School, Digby; to command vice Group Capt. T. L. Leigh-Mallory, D.S.O., 11.11.35.

Wing Commanders.—J. V. Steel, O.B.E., to Headquarters, Fighting Area, Uxbridge; for duty as Senior Personnel Staff Officer, 2.11.35. L. M. Bailey, A.F.C., to Home Aircraft Depot, Henlow; for Administrative duties, 1.11.35.

Squadron Leader.—D. H. Humphreys, to No. 17 (F) Squadron, Kenley; to command vice Sqn. Ldr. H. S. Broughall, M.C., D.F.C., 31.10.35.

Flight Lieutenants.—N. B. Norris, to No. 2 Armoured Car Company, Ramleh, 23.10.35. G. F. Simond, to Headquarters, No. 1 Air Defence Group, 9.11.35.

Flying Officers.—H. V. Horner, to Home Aircraft Depot, Henlow, 3.11.35. D. W. Baird, to No. 55 (B) Squadron, Hinaidi, 10.10.35. P. I. Harris, to No. 47 (B) Squadron, Khartoum, 13.10.35.

Pilot Officers.—D. M. Newman and R. V. L. Pattison, to No. 28 (Army Co-operation) Squadron, Ambala, India, 17.10.35, instead of to No. 5 (Army Co-operation) Squadron, Risalpur, as previously notified. R. L. Vivian, to No. 20 (Army Co-operation) Squadron, Peshawar, India, 17.10.35. F. Holman, to No. 99 (B) Squadron, Mildenhall; on appointment to a short service commission as Pilot Officer (on probation), 16.10.35. K. E. Cornabe, to No. 812 (F.T.B.) Squadron, 18.10.35. J. Shepherd-Smith, to No. 800 (F.F.) Squadron, 18.10.35.

Acting Pilot Officers.—C. G. Masters, to No. 1 Armoured Car Company, Hinaidi, 25.10.35. The undermentioned are posted to No. 2 Flying Training School, Digby, with effect from 2.11.35:—R. N. Brett, N. A. F. Cheesman, J. Compton, P. E. G. G. Connolly, G. I. L. Corder, M. W. Donaldson, G. D. Evers, T. E. J. Fitton,

Erratum
In the Gazette of October 29 for Caesar Barrand Hull read Caesar Barrand Hull.

ROYAL AIR FORCE RESERVE

*Reserve of Air Force Officers**General Duties Branch*

The following Pilot Officers are promoted to the rank of Flying Officers:—D. O. Young (September 6); D. B. Allison, G. K. Brackenridge, A. M. Carroll, J. E. I. Crump, D. H. Dey, M. L. Formby, K. W. Hole, T. S. R. King, L. Molec, B. J. Sciortino, H. S. Smith, J. G. Tait, M. Wyatt (September 12); R. G. Allen, R. K. Beale, L. B. Greensted, D. M. Maw, H. D. Ripley, A. K. L. Stephenson, J. F. Wells, R. G. Wilberforce (September 19); J. Dendy, B. R. Ker, D. W. Llewellyn, M. N. Mavrogordato, W. R. Oliver, E. A. Starling, T. E. Wesson (September 27).

The following are transferred from Class A to Class C:—Flt. Lt. H. F. Jenkins (November 7); F/O. H. W. Knott (November 10).

F/O. C. H. Howitt relinquishes his commission on completion of service and is permitted to retain his rank (August 21).

The following relinquish their commissions on appointment to short service commissions in the Royal Air Force:—F/O. E. Rosslyn-Stuart (October 22); P/O. G. I. L. Corder (October 21); P/O. J. W. S. Forbes (October 21).

Medical Branch

Flt. Lt. A. H. Barzilai, M.B., Ch.B., relinquishes his commission on appointment to a permanent commission in the Indian Medical Service (November 1).

SPECIAL RESERVE

General Duties Branch

F/O. R. H. Watson is promoted to the rank of Flight Lieutenant (October 31).

J. W. S. Forbes, H. J. Garlick, A. J. Goldie, A. R. L. Griffiths, N. D. Guthrie, H. A. Hornblow, N. T. Ingham, J. H. Irvin, E. O. Jones, D. Kain, L. S. Lawrence, W. G. Lockhart, H. C. Maudslay, D. I. McLeod, M. C. F. Mee, P. A. B. Neel, J. P. Owen, L. V. E. Petley, A. V. Rogers, E. Rosslyn-Stuart, J. E. J. Sing, J. P. S. Smyth, F. W. Thomas, A. C. R. Thompson, Y. P. Wilson, and A. L. Womersley. K. E. Kennedy, to No. 2 Flying Training School, Digby; on appointment to a short service commission as Acting Pilot Officer (on probation) with effect from 4.11.35. The undermentioned are posted to R.A.F. Depot, Uxbridge, on appointment to short service commissions as Acting Pilot Officers (on probation) with effect from 6.11.35:—D. L. Amlot, H. W. Bolinbroke, H. F. Bromwich, H. G. L. A. Brooking, M. H. T. Cooke, V. D. H. Elkington, J. L. Forbes, E. Graham, F. E. R. King, D. S. Macdonald, W. I. McConnell, J. N. Mahler, F. M. Milligan, G. T. Openshaw, J. A. Richards, D. E. C. Trench.

Stores Branch

Squadron Leader.—F. H. Sims, to Headquarters, R.A.F., Iraq, Hinaidi; for Equipment (Stores) Staff duties, vice Sqn. Ldr. W. Thorne, 25.10.35.

Flight Lieutenant.—R. B. Horstmann, to Aircraft Park, Lahore, India, 17.10.35.

Medical Branch

Squadron Leader.—F. W. Goodread, to R.A.F. Officers' Hospital, Uxbridge; for duty as Medical Quartermaster, 9.11.35.

Chaplains' Branch

Rev. H. F. Daniels, to Headquarters, R.A.F., Palestine and Transjordan, Jerusalem, 16.10.35.

AIR COMDRE. CHAMIER ON AIR DEFENCE

AIR COMMODORE J. A. CHAMIER, speaking to members of the British Empire League at the British Empire Club in London last Thursday, dealt with the subject of air defence.

All the casualties caused in this country by air raids in the Great War, he said, totalled 4,830, but air raids of the future would drop much greater loads of bombs, and the nation should be much better prepared to meet any attack.

They could not rely on international action to protect them, although that might grow more powerful in future. They could not wait for week: if it was a question of attack by aircraft, and for that reason they could not rely on the aboli-

tion of air forces and the so-called internationalisation of civil aviation.

Their only safe policy was to look to their own defences and to try to obtain an international agreement to a limitation of the most threatening of air weapons.

Much of their defence must take the form of offence to throw the enemy partially on the defensive. Air Commodore Chamier suggested that the equipment of fighting aeroplanes should included the *canon*, and that balloon aprons and "aerial minefields" might be developed for defensive purposes. Industrial organisation should arrange for the widest distribution of industries to reduce possible damage.

Correspondence

The Editor does not hold himself responsible for the views expressed by correspondents. The names and addresses of the writers, not necessarily for publication, must in all cases accompany letters intended for publication in these columns.

SIR JOHN CARDEN ON "POU"-FLYING

[3083] The other day I flew Mr. S. V. Appleby's *Pou* for the first time, and the experience may be of interest.

I took off without using the gradual method—rightly advocated by Mignet. For the first few seconds in the air the lateral control was hectic; one soon gets the hang of it, though, after which everything is easy.

The take-off is by far the most dangerous part. If taken off too soon the machine porpoises, finally finishing on its nose. If it is allowed to swing taking off, the same thing happens. Incorrect position of the top wing makes things worse, as it causes the machine to take off sooner than it should.

If people do not take the greatest care in the early stages there will be much disappointment and many crashes. I have seen it happen so often, both in France and England. It seems to me that it is only help and instruction from the Press which will prevent this sort of thing happening.

Once in the air everything is fine—the angle of climb is as steep as in most aeroplanes, the view is excellent, there is no vibration, and the seating position very comfortable. Lateral control and turns are quite easy.

The machine covered the ground at 75 m.p.h. all out, and I had 600 revs in hand without losing height—very much as on an ordinary machine. There is a general feeling of having plenty of power in hand and that the engine is taking things very easily.

Landing is the simplest thing in the world—just point the nose at the ground and come in as fast as you like; when quite near, pull back, and after floating a foot or so off the ground for a short distance the machine lands itself.

I have become quite enthusiastic about the *Pou*, and believe that, considering the very large number of brains working on it, both in this country and abroad, it is inevitable that it will soon become quite a useful aeroplane and certainly wonderful value for money.

JOHN V. CARDEN.

Camberley, Surrey.

"FROM THE PASSENGER'S ANGLE"

[3084] I was interested to read "Traffic Manager's" reply, in your issue of October 31, to "C. R. H.'s" grumbles (issue of October 24). May I suggest that the latter's complaints are absurdly loud, and that the intelligent passenger in an up-to-date air liner ought more properly to be lost in wonderment and gratitude at the marvels which our engineers and companies lavish on us?

Coming out to Switzerland last August by *Horatius* (Imperial Airways), I found myself exceedingly comfortable in every way; regaled with the pleasant and the picturesque throughout; nothing to complain of whatever; much to be grateful for and enjoy. I could not but greet delightedly what scientific progress had brought me.

The neurasthenics who grumble are of very secondary importance to the very numerous silent passengers who appreciate heartily what has been done for them. Those who complain of bodily discomforts during "bumps," ascents and descents, etc., would be better on the ground. Or, if they insist on voyages in the air, they ought first to sample the training undergone in a light open aeroplane in really mountainous country. Their approval of the comforts of the air liner would be marked; they would realise how great progress has been.

COMMONSENSE.

Switzerland.

[3085] In your "Outlook" columns a few weeks ago you mentioned the case of an airline passenger who suffered considerable pain "behind the eyebrows" when making the first descent on a journey, no discomfort being felt on subsequent descents the same day.

As this appears to fit my own case, I am wondering if anyone can suggest a reason—or, more important, a method of alleviation; the standard swallowing and so forth is quite useless.

Weybridge, Surrey.

PINS AND NEEDLES.

AERODROMES OUT OF THE PETROL TAX

[3086] A week or two ago the newspapers announced with a great flourish that £100,000,000 was to be spent on the roads. As far as I can see, in this district most of the important and necessary road improvements have already been made, and the "highwaymen" are now turning their attention to spoiling the charm of our beautiful rural lanes. If the same stage has been reached in other parts of this country this spending of £100,000,000 on roads would seem to be absolutely unnecessary, and it would be far better to spend a proportion of this huge sum on the provision of simple aerodromes of about 500 x 500 yards square close in to every town of importance.

Future road development will depend to a large extent upon the positions of the aerodromes; so the aerodromes ought to be made first.

Finally, it should be pointed out that aeroplane users have to pay the 8d. per gallon petrol tax, so that it is only fair that this money should be applied to the provision of aerodromes in the same way that the Road Fund is applied to the provision of roads, particularly as increased use of the air will relieve congestion on the roads.

ERIK J. W. ADDYMAN.

Starbeck, Harrogate.

REVOLUTIONARY

[3087] Many attempts have been made and are still being made to evolve a practical means of flying by the force or power developed by a man, but up to now nothing that could be called practical or commercial, even as a sport, has resulted from these experiments.

I want to give my idea to anyone who has enough money for this kind of experiment, and would be very glad to communicate with anyone who is interested.

My idea about human flight is quite possible as long as we get the profit of the full power and weight of a person. The machine I have conceived could be described as a "pedal Autogiro" in which all the benefits of the bird's flight are adapted to the Autogiro system. The machine will be something like a pedal cycle with a vertical axle adapted and fixed to the cycle over the head of the cyclist. On this axle a four-bladed Autogiro propeller would slide up and down by the action of the pedals, and in this way rotation and lift could be obtained. The pedals would communicate with the rotor by chains and a small crankshaft attached to the chains by a free wheel in such a way that the full power of the down stroke of the cyclist would only be communicated to the rotor.

The lifting of this rotor and the machine would be obtained automatically by the force accumulated on the rotor by sharp pedalling on the down stroke, that would allow the rotor to rotate on the free wheel and accumulate enough lift to hold the machine up in the air until the next stroke commences—in the same way in which birds maintain a straight flight, even when they raise their wings.

Once the rotor is at the top of the vertical axle the pedals could be rotated easily to the best position for getting full power for the next stroke.

As an alternative to this way of pedalling it would be also easy to make a machine in which two of the blades of the rotor would have an alternative movement with the other two, so that continuous lifts could be obtained and the forces due to inertia would be balanced. In this way it would be easier to apply a small engine if wanted, and vertical flight could be obtained as well as stillness in the air without profiting by air currents.

I have studied and sketched all the details of these machines, and I think if properly constructed they should not weigh more than 70lb. I consider a 6-metre rotor diameter to be enough for experimenting.

The controls should be similar to the Autogiro and adapted to the handlebar of the cycle, but the difference from the Autogiro would be a system of an automatically inclined rotor by means of which gyroscopic forces would be reduced to zero.

Bilbao.

I. ZUBIAGA.

COMPULSORY THIRD-PARTY INSURANCE

To Give Effect to the Recommendations of the Gorell Committee it is Proposed to Pass a Bill Which Shall Incorporate in the Air Navigation Act Provisions or Limited Compulsory Third-party Insurance

FREEING civil aviation from some of the fetters which at present hinder its development was the object of many of the recommendations made by the Gorell Committee a little more than a year ago, and in a large number of cases the Air Ministry accepted the recommendations. Hitherto, effect has not been given to the Air Ministry's acceptance of these recommendations, but it now appears that the introduction of a Bill dealing with one of them will follow fairly closely upon the opening of the new Parliament. Something of a start was made a short while ago, when the Air Ministry agreed to let the *Pou-du-Ciel* be flown without a certificate of airworthiness provided a third-party insurance were taken out. This decision was a direct outcome of the recommendation of the Gorell Committee, and the Air Ministry's acceptance thereof, that a scheme of compulsory third-party insurance, or adequate alternative indemnity, should be introduced. The Committee suggested as a basis for such insurance £100 per 100 pound weight of the aircraft, subject to upper and lower limits of £25,000 and £5,000 respectively.

The Bill which is about to be introduced will, it is understood, adopt this basis, the higher figure applying to an all-up weight of 25,000lb. and over, and the lower to an all-up weight of 5,000lb. or under, the maximum for intermediate weights being calculated on a basis of £100 per 100lb. weight. It is proposed that for balloons the maximum should be £5,000, for airships £25,000, and for gliders £1,000. It is intended that half of these maxima shall be primarily applicable to claims for loss of life or for personal injury.

Limitation of Liability

It is proposed that the limitation of liability shall apply only if the aircraft is duly insured. If for any reason the aircraft is not covered by insurance, the owner will be liable, as now, under Section 9 of the Air Navigation Act for the full amount of the damage, whatever that may be.

If the loss or damage is caused by wilful misconduct, or by negligence of the owner or his servants or agents, it is proposed that the limitation of liability shall not apply. Negligence in piloting, handling or navigating the aircraft is not intended to involve withdrawal of the limitation.

The obligation to insure is to rest on the owner of the aircraft, "owner" being intended to include for this purpose one who is purchasing the aircraft by instalments. An aircraft let or hired out for a period exceeding fourteen days is held to be the property of the hirer. Liability for any loss in excess of the maximum for the particular type of aircraft will rest with the third party who may, of course, insure against the excess risk.

It is suggested that provision should be made for covering in two ways, either by taking out an insurance with an approved insurer, or by depositing with the Accountant General of the Supreme Court the sum necessary to cover the maximum liability for any one accident. Where two or more aircraft are operated by one owner, the insurance or security deposited may be limited to the maxima for the two largest of the aircraft concerned.

The insurance or security will be as far as possible a complete guarantee of indemnification for the third party, and in all normal circumstances it should protect fully against loss. Certain exceptional circumstances are, however, considered in which liability will be avoidable. For example, when the accident occurred outside the limits of time or territory covered by the policy; when the Certificate of Airworthiness or licence to fly had not been issued, or had expired; when the insurance was obtained by fraud or by the non-disclosure



The more the merrier!

of a material fact; when the policy had been cancelled before the accident and the insurance certificate had been surrendered. Cancellation of a policy must have been notified to the Air Ministry at least seven days before the accident if it is to be a valid defence against a third-party claim. The policy of insurance may disclaim liability for loss or damage caused by conditions of war, riot or civil commotion.

In the above circumstances, the insurer will not be liable to the third party. The owner's liability, however, will still stand and will be for the full amount of the loss irrespective of the financial limits provided for in the insurance scheme. It is intended that it shall be open to the insurer to stipulate in the policy that the insured shall bear the risk up to the first £5.

Passengers carried in aircraft are not covered by the terms of Section 9 of the Air Navigation Act and the insurance need not cover loss or injury suffered by them, nor need it cover loss or damage to goods carried in the aircraft. It will, however, cover all damage to passengers and property on the ground, and will thus apply to passengers who have not yet entered the aircraft or who have alighted therefrom and are injured on the aerodrome by an aircraft.

It will be provided that neither a policy of insurance nor a security will be of any value unless the insurer has delivered to the aircraft owner a certificate of insurance or security in the prescribed form. The certificate of insurance or security must be carried in the aircraft and produced for inspection by authorised officials, by the police, or by injured third parties. Before taking-off a pilot must satisfy himself that a certificate of insurance or of security is in force.

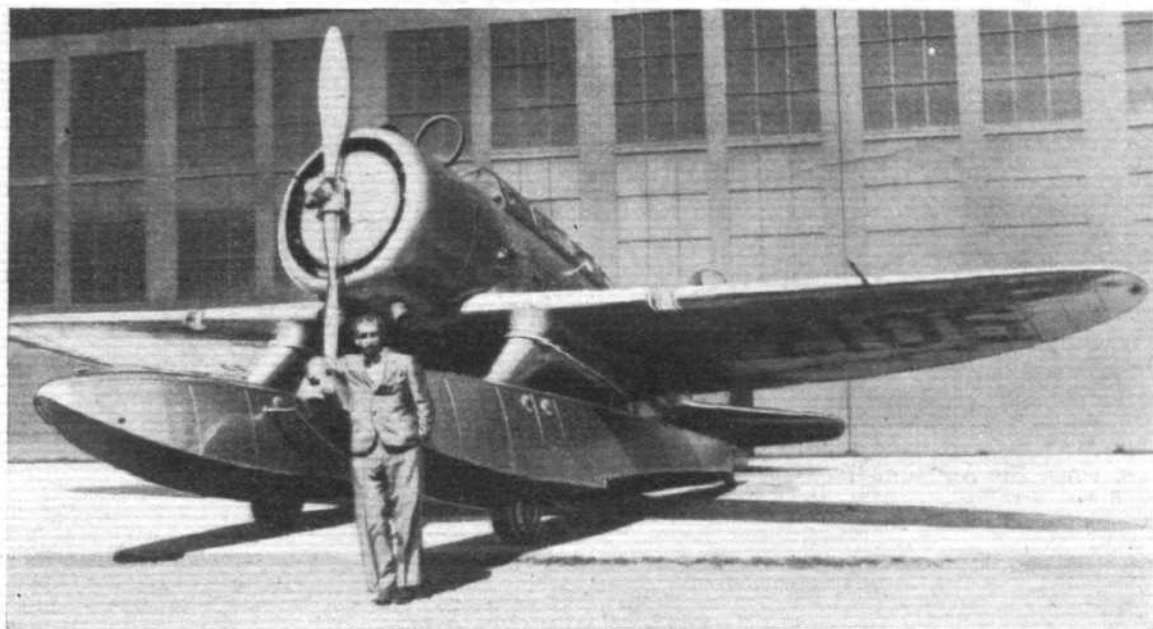
The procedure which it is intended should be followed in the case of registering and insuring an aircraft is as follows: First the machine should be registered as at present. Then its Certificate of Airworthiness will be issued if it is an aircraft requiring such a certificate. No Certificate of Airworthiness will be required by private aircraft to be flown in this country only. Next, the insurance or security will be obtained and the necessary certificate furnished to the owner. This step will, of course, follow directly on the registration in the case of private aircraft to be flown at home only. Finally an official licence to fly, a new document, will be issued upon production of the certificate of insurance or security. The licence to fly will cover only the period for which the insurance is valid.

Failure to comply with the regulations concerning third-party insurance will be accompanied by liability to penalties under the Air Navigation Act, the ordinary penalty being a term of imprisonment up to six months or a fine up to £200, or both imprisonment and fine.

The third-party insurance which will be made compulsory by the proposed amendment to the Air Navigation Act will apply to all civil aircraft flying in Great Britain and Northern Ireland and the territorial waters adjacent thereto. It is intended to take power in the proposed Bill to apply, by Order in Council, the Rome Convention of 1933 to this country in the event of it being decided by the British Government to ratify that Convention.

HERE and THERE

Aerodrome Equipment Exhibition for London : Oil Supplies in War : An Interesting Landing Light : Recent Books Reviewed



APPLY NAMED : This is the Seversky amphibian which, fitted with a Wright Cyclone nine-cylinder radial of 750 h.p., recently broke the world's speed record for machines in its class with a speed of 230.03 m.p.h. The fastest lap of the course was made at 236 m.p.h. At the controls was the designer of the machine, Major Alexander de Seversky, who is seen in this photograph. He was accompanied on the record flight by his spaniel.

Aerodrome Equipment on Show

IN connection with the annual conference of the Aerodrome Owners' Association (a sub-division of the S.B.A.C.), which takes place at the end of January, an exhibition of aerodrome equipment is to be held.

British Industries House, Marble Arch, London, W.1, is to be the venue of both the conference and the exhibition, and the latter will be divided into ten sections, as follows:—(1) First-aid supplies; (2) agricultural machinery and equipment; (3) fire-fighting equipment; (4) lighting and signalling; (5) handling and servicing equipment; (6) buildings; (7) paints, varnishes, etc.; (8) wireless and meteorological equipment; (9) fuel supplies; (10) aerodrome preparation, levelling and draining.

The show, which will take place on January 30 and 31, may be extended to February 1 as well. It will not be open to the general public, but will be primarily intended to interest the aerodrome operators and others attending the conference.

Full details are obtainable from the Secretary, Mr. H. R. Gillman, 32, Savile Row, London, W.1.

Oil Supplies in War

"IT is a fact that the production of benzole and petrol from British coal, plus the petrol made by the hydrogenation of existing crude coal oils, is even to-day more than enough to keep the Royal Air Force in the air. Large additional quantities would be required in war, both for the Army and home road transport." This was one of the striking passages in a paper read by Lieut.-Col. W. A. Bristow before the Royal United Services Institution last Wednesday. He went on to add: "I should like to make it clear that there is little likelihood of our ever being able to make in this country any really substantial proportion of our total requirements of petrol and oils."

Col. Bristow began by stressing the dependence of this country on oil fuel, and pointed out the risk of our supplies being interfered with in time of war. He urged that a number of underground storage depots should be laid down inland in open agricultural country away from aerial landmarks. The scheme might cost as much as twenty million pounds, but it might conceivably save the country in war.

He also urged that more effort should be made to develop our seams of high volatile bituminous coals for this purpose. He mentioned a field in the Midlands called the Barnsley Red, a great deposit of rich bituminous coal which stretches roughly from Nottingham to Leeds, and probably under the sea to Norway. He said that it was most unfortunate to see so much of the best portion of this oil-coal seam being burned for ordinary steam-raising purposes. "It is," he said, "almost as bad as chopping up the lid of the grand piano for firewood."

Wireless Valves Data

A MUCH appreciated annual feature of *The Wireless World* appears to-morrow—Friday, November 22. It is a special number devoted to the subject of valves, and a 24-page supplement is included which gives in a concise form all essential data required by set designers and users concerning all types and makes of modern British receiving valves.

Chelsea's Party

THE annual dinner and dance of the Colleges of Automobile and Aeronautical Engineering, Chelsea, will be held at Grosvenor House, London, on Tuesday, December 3, at 8 p.m.

Old students who wish to attend should apply for tickets to the Secretary of the Colleges, at Chelsea.

The Lowe-Wylde Fund

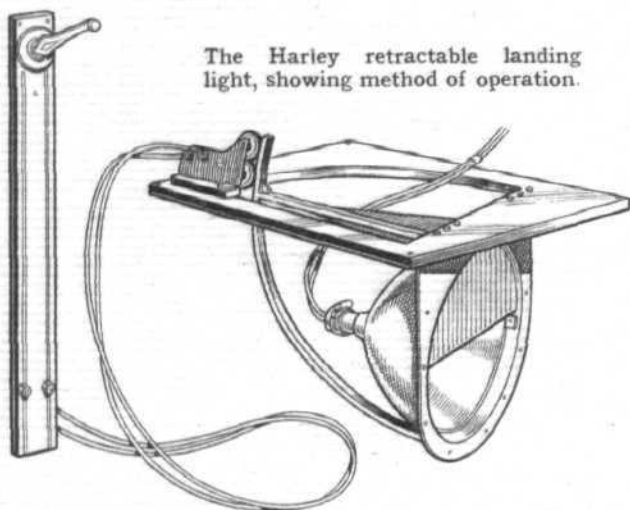
THE latest list of donations to the Lowe-Wylde Memorial Fund brings the total up to £630:—

	£	s.	d.
Mrs. J. M. McLoughlin	4	0	0
Mollart Engineering Co.	3	3	0
M. Sassoon	3	0	0
E. H. F. Fuller	2	2	0
F. T. Lett	2	2	0
B. Shorthouse	2	2	0
Leslie H. Ransom	2	2	0
H. K. M. Kindersley	1	1	0
L. H. P. Meyer	1	1	0
William H. Whitbread	1	1	0
R. Cowell-Smith	1	0	0
A. York Bramble	10	6	
V. S. Gaunt	10	6	

Donations should be sent to Mr. E. C. Gordon England at the London Air Park, Feltham, Middlesex.

Here and There.—**The Harley Landing Light**

SOME interesting features are to be found in the Harley landing lamp, which is made in three types—a vertical flipper pattern suitable for mounting in the nose of an aeroplane; a fully retractable type for wing mounting; and a streamline type suitable for external fitting. These types, again, are sub-divided into 6in. and 8in. models fitted with bulbs taking 12 amps at 12 volts, and an 11in. model taking 10 amps at 24 volts.



The Harley retractable landing light, showing method of operation.

The illustration clearly shows the method of operation of the retractable type—a chain, running over a sprocket on the shaft of a winding handle, is attached to the ends of two Bowden wires which pull the lamp-operating segment up or down as required. Thus, not only can the lamp be fully retracted, but the angle of the beam can be altered at will by the pilot to suit landing and taxiing conditions respectively.

It is intended that these lamps should, where possible, be fitted in pairs, but in cases where only one is used a double-filament bulb is fitted, thus providing a reserve source of light in the event of breakage of the main filament. The respective weights of the 6in., 8in. and 11in. lamps, without mountings, are 2½ lb., 4½ lb., and 9 lb.

Enquiries respecting the Harley lamp should be addressed to Smith's Aircraft Instruments, Cricklewood Works, London, N.W.2.

Parlour Pilotage

AN entertaining indoor game which will please young enthusiasts—and many older ones as well—is "The Great Air Race," which is based on the England-Australia contest and fairly bristles with hazards for the "competitors." It is obtainable at 2s. 6d. from W. H. Smith and Sons and leading stores.

THE BRITISH AIRCRAFT INDUSTRY

IN a fortnight's time—that is, on Thursday, December 5—there will be published an issue of *Flight* of outstanding interest and utility.

It is the Annual Special BRITISH AIRCRAFT INDUSTRY NUMBER, and it will review all the types of aircraft at present marketed by more than thirty British firms. A large number of dimensions and performance figures will be given. In addition, there will be detailed data on all British aero engines, and a review of the many items which come under the heading of accessories and components.

Thus this special issue will constitute an extremely useful work of reference, for those both inside and outside the trade.

THURSDAY

FLIGHT

DEC. 5

Putting the Sun in the Shade

A NEW type of mercury lamp having, it is claimed, a light-intensity greater than that of the sun, has just been perfected in the research laboratories of Philips Lamps, Ltd. It is only a quarter of an inch thick and can be made any length upward of one inch, according to requirements. Already one of these lamps—no bigger than a lead pencil—is being used to floodlight Eindhoven aerodrome in Holland. It is likely to be at least another six months before any of these lamps appear on a British aerodrome.

Apparently the lamp's efficiency is derived from the enormous pressures (150-300 atmospheres) at which it works, the brilliancy, of course, being in proportion to the pressure. Even the comparatively low pressure lamp (150 atmospheres) is claimed to have a light-intensity one quarter that of the sun, or two hundred times that of an ordinary electric light bulb five or six times its size.

To withstand the terrific pressures and temperatures involved (the latter amount to four to eight thousand degrees C.), the bulb is made of quartz instead of glass and, in the highest-efficiency models, is water-cooled. Mercury is employed for the electrodes, which have specially prepared projecting tungsten wire points. It is said that the lamp was made possible by the discovery of a method of hermetically sealing these tungsten wires into the quartz tubes in spite of the different coefficient of expansion of the two materials.

Aluminium-bronze Sparking Plugs

AMONG interesting exhibits on the Lodge stand at the Olympia car show were a range of "golden" racing plugs, the actual metal employed for the bodies being aluminium-bronze, the material used for imitation gold cigarette cases and the like. In the plug industry aluminium-bronze is now being employed because of its remarkable heat-conducting properties as compared with those of the usual mild steel, and plugs so constructed have great possibilities for racing.

FACT AND FICTION

"A Story-Teller Tells the Truth." By Berta Ruck (Hutchinson, 18s.)

INTENDED primarily, perhaps, for the entertainment of her own sex, this racy autobiography of a well-known woman novelist includes a long chapter on flying people she has known. She introduces her readers to such pioneers as Mrs. Maurice Hewlett, talked of war-time pilots of greater and lesser renown, and, coming up to the present day, offers pen-portraits of such people as the Mollisons and their contemporaries.

She has many friends and acquaintances, too, in the industry. Her first flight was made under coercion from her sons ("You'll be the laughing-stock of England if you write stories with aeroplanes in them and haven't been up in one yourself"). The machine was a Moth, the place Stag Lane, and the pilot Captain Geoffrey de Havilland. "What a waste of life, when I might have been up before! . . . now . . . I know what it is to do a morning's shopping in sunny decorative Vienna, at mid-day to board silver-winged *Dædalus*, to speed over the European map, correcting the proofs of this book, then to land at Croydon in time for dinner at my club. . . ."

"Last Flight." By Barbara Hall. (Longmans, Green and Co., 6s.)

The introspective hero whiles away the time on a Pacific flight wondering if he isn't too old to be doing that sort of thing at forty. Having suffered the fate which one would expect his attitude of mind to produce, he is picked up by a ship, in which he resumes his introspections—until, of course, he meets Her. But since nobody can decently get away with a six-shilling novel of less than 136 pages there are complications and another ditching.

No technical bricks accompany the author's aeroplanes into the ocean.

"The Book of the Aeroplane." By Captain J. L. Pritchard. (Longmans, Green and Co., 7s. 6d.)

This, the third edition (the first was published in 1926), has been brought right up to date and, for youthful readers, should form an extremely useful introduction to an interest in aeroplanes and aviation. To older folk who may be already in

the game, it offers a chance for filling up gaps in their knowledge, and in many ways, especially as regards the eighty illustrations, it forms a useful reference book.

Capt. Pritchard (who, of course, is secretary of the R.Ae.S.) has packed a surprising number of facts and figures into 250 pages and, moreover, has sufficiently embellished them with comment to lift the work right out of the "dry text book" category.

R. E. C.

"Aircraft," by Le Corbusier. The "New Vision" Series. (The Studio, Ltd., 5s.)

The aeroplane indicts the city and those who control the city. Mankind is forcing man to fit the city when the city should be made to fit man. And the aeroplane, which has given us a bird's eye view of the world, shows the extent

of the city's tyranny. The aeroplane symbolises a new age.

Such is the burden of the singularly impassioned "frontispiece" and the somewhat hysterical quasi-captions to the very excellent photographs in the latest of the "New Vision" series published by *The Studio*. Certainly one cannot help being impressed both by the reading matter and by the illustrations, which are picked examples arranged, as might be expected, to be shown to their best advantage. A perfectly good aerial view of the City of London lends drab colour to the suggestion that our living quarters have muddled themselves into being, and that a really thorough air attack might eventually prove to be a blessing in disguise! But the aeroplane, whose virtues and beauties are extolled, is a product of the same civilisation which has produced the tenement. We must be ready to build before we can afford to destroy.

H. A. T.

VISITING the U.S.S.R.

Some Useful Hints for Private Owners Who Contemplate Including a Visit to Russia in their Next Year's Air Touring Plans

A PARTY of English tourists have recently visited Russia by private aeroplane. In the following notes they offer *Flight* readers the benefit of some of their experiences, and a few useful hints.

The authorities in the Soviet Union (they write) have indicated that they are fully prepared to welcome English private owners, and in the summer months touring by air in Russia is a perfectly practical proposition. As in many other countries, however, certain formalities are essential and a flying permit, to be obtained through the Russian Embassy or Consulate in London, is necessary. This may take a considerable time to obtain, and the intending visitor should apply for it at least two months before his departure. When a permit has been obtained, a passport visa will be automatically granted. On the permit to fly will also be given the exact route of entry, and this must be very closely followed, as the frontier guards are usually warned.

For Leningrad the route would probably be *via* Riga and Tallinn, but for Moscow the route is *via* Kaunas and Velikije-Luki. Both these are the routes followed by the Deruluft Company. Previous notice by telegram should be sent when the visitor intends leaving to cross the frontier into Russia and the approximate time of arrival stated, as the aerodrome authorities will be duly warned. It can probably be arranged for a map, prepared by the Russian authorities, to be waiting at Kaunas, and this should be handed in on arrival at one's destination. The map problem is a serious one, as up-to-date maps of Russia cannot be obtained in England. This snag, however, may be overcome if the pilot presents himself to the civil flying authorities in Moscow, who will probably provide him with special strip maps of the places he intends visiting. These maps are good and efficiently prepared.

The intending visitor should also, unless he has an adequate knowledge of the Russian language, attach himself to In-

tourist, which is the Russian Government Touring Bureau. This organisation will arrange for him to be met at Moscow and supply an interpreter and guide; in fact, unless he is a fairly good linguist, this is essential.

As regards the money problem, visitors are forbidden either to take in or take out Russian currency, but, generally speaking, this presents no difficulties, as all payments at Intourist hotels, and also at *torgsin* stores, can be made in most foreign currencies; it is, therefore, as well for the visitor to take a plentiful supply of foreign currency to cover his needs. Living is on the expensive side, so that an adequate amount should be taken.

Generally speaking the territory, at least from Leningrad to the South, is exceedingly good flying country, with flat land and large-sized fields. The entry from Kaunas *via* Velikije-Luki is, however, wooded and marshy, with a number of lakes and swamps.

The service on the aerodromes is, on the whole, very good, and the aerodromes themselves are mostly very large; refuelling arrangements are adequate, but care should be taken in selecting fuel to suit the particular engine. "Bakinski" petrol seems to be most suitable for such engines as the Gipsy. The control on the aerodromes is also very efficient, but hangar accommodation, except at Moscow, is very limited; in fact, at some aerodromes it is non-existent, so that picketing gear should be taken.

The intending visitor planning a tour round Russia by air should first of all consult Intourist, as he will be well advised to keep to those places where Intourist have an organisation and hotels. Again, on arrival in Moscow he should consult the Civil Air Authorities from the point of view of permission to land at the places he wishes to visit, and to obtain maps and information as to refuelling, routes, etc. These authorities will, so far as they can, render every assistance.

ROYAL AERO CLUB OFFICIAL NOTICES

Two Race Announcements

COUPE DEUTSCH DE LA MEURTHE.—The annual contest for the Coupe Deutsch de la Meurthe will take place on September 13, 1936, and will be flown over a 100-km. circuit, starting and finishing at Etampes-Montdesir. The total distance of the contest is 2,000 km.

The first prize is 100,000 francs, and in addition to this prize the French Air Ministry will donate 900,000 francs for the purchase of the winning aircraft. In previous years the special prizes offered by the French Air Ministry have been confined to the French Aircraft industry, but for the year 1936 they are thrown open to competitors of all nationalities.

The contest is open to aircraft fitted with engines the total cylinder capacity of which must not exceed 8 litres.

Entries will be received up to December 20, 1935, at an entry fee of 2,000 francs. Late entries will be received up to June 15, 1936, at a fee of 6,000 francs. In each case half the entry fee is returnable to all competitors starting in the race.

Regulations may be obtained from the Secretary of the Royal Aero Club, 119, Piccadilly, London, W.1.

Paris-Saigon-Paris Race.—The Paris-Saigon-Paris contest organised by the Aéro-Club de France will start from Paris on October 26, 1936.

The compulsory landing places on the outward journey are Baghdad and Allahabad, making a total distance of 10,651 km., and on the homeward journey, Allahabad, Baghdad and Cairo, making a total distance of 11,296 km.

In addition to the various trophies, the winner has the option of handing over his aircraft to the French State in return for a cash prize of 1,200,000 francs.

The contest is international, and open to aircraft which must be able to effect a stage of 3,700 km. without the necessity for landing.

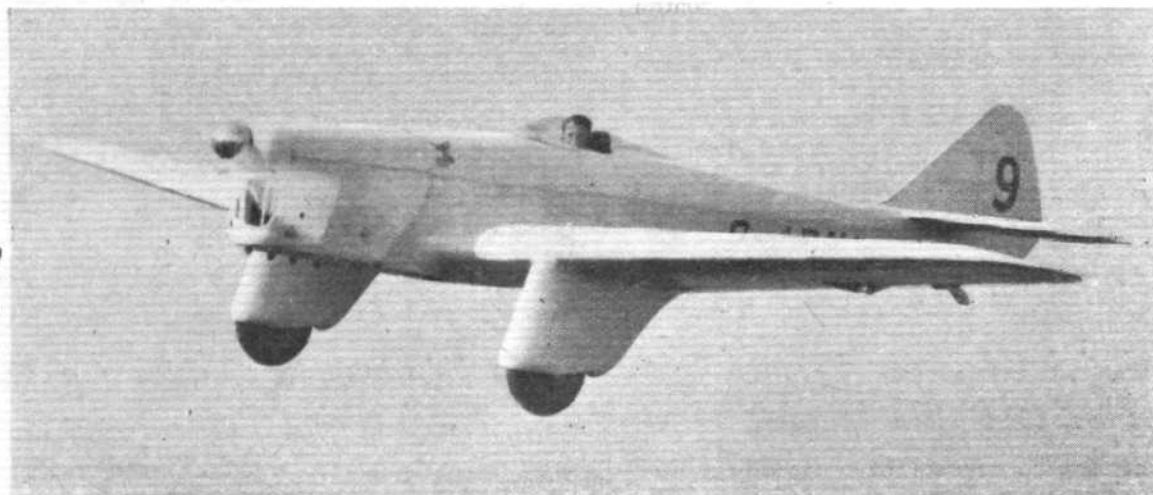
Entries will be received up to May 25, 1936, with an entry fee of 2,000 francs. Late entries will be received up to July 24, 1936, with an entry fee of 5,000 francs.

Regulations may be obtained from the Secretary of the Royal Aero Club, 119, Piccadilly, London, W.1.

HAROLD E. PERRIN, Secretary.

A SPORTS MODEL

The Miles Sparrow Hawk : 180 m.p.h. with a High Compression Gipsy Major



The prototype Sparrow Hawk in the hands of Flt. Lt. "Tommy" Rose.

IN the King's Cup Race this year an attractive little sports monoplane, then known only by the Phillips and Powis works number M.5, was flown by its designer, Mr. F. G. Miles. Since that time the company has decided to put this type on the market as a fast sporting machine for the private owner and as a military trainer. One of the most attractive of its abundant qualities is the low landing speed of 42 m.p.h. which it possesses in spite of its maximum speed of 180 m.p.h. with a high-compression Gipsy Major engine.

In general appearance the machine somewhat resembles the Hawk Major, but it is a rather smaller type with a span of only 28ft., whereas the Hawk Major's span is 33ft. The height also is considerably less. Structurally it is a typical Miles product, wood being used throughout, the covering of fuselage and wings being plywood.

In the Sparrow Hawk the centre section extends only for the width of the fuselage and the undercarriage legs are attached to the wing somewhat further outboard than in previous designs. The machine may be used either as a single-seater or a two-seater, the front cockpit being covered over in the former case. Miles split trailing-edge flaps are included as standard equipment. The price is £825.

MILES SPARROW HAWK

Light Sports Monoplane

Gipsy Major (High Compression)

DIMENSIONS.					
Span	...	...	...	...	28ft.
Length	...	...	...	...	23ft. 6in.
Height	...	...	...	...	5ft. 7in.
WEIGHTS.					
Tare weight	...	...	...	...	1,080 lb.
Gross Weight	...	...	...	...	1,750 lb.
PERFORMANCE.					
Maximum speed at 1,000ft.	...	...	...	...	180 m.p.h.
Cruising speed at 1,000ft.	...	...	...	...	155-160 m.p.h.
Range (22 gallons)	...	...	...	...	415 miles.
Stalling speed	...	...	...	...	42 m.p.h.
Fuel consumption at cruising speed	...	...	...	...	8½ gall/hr.

N.B.—The above figures are for the machine with the front cockpit covered in.

With the standard Gipsy Major the maximum and cruising speeds are reduced by 5 or 6 m.p.h. but the range is increased to 540 miles.

AN UNORTHODOX TRANSPORT

A Surprisingly High Performance and Extraordinary Layout Characterise the New Burnelli Monoplane

THE latest product of the Upperco-Burnelli Corporation of Keyport, New Jersey, is the UB-14A transport monoplane, which incorporates the aerofoil section fuselage of earlier Burnelli designs, but takes advantage of modern aids to aerodynamic efficiency. As previously recorded in *Flight*, the agents in Great Britain are W. S. Shackleton, Ltd., 175, Piccadilly, W.1, and the machine was illustrated in the issue of November 7. Another photograph appears on p. 531.

Unusually spacious cabin arrangements have been made possible by the broad fuselage and, due to the high wing, an excellent downward view is possible from the side windows. Entrance doors are located on each side of the cabin proper, and there are baggage compartments in the wings. To the rear of the cabin, which has seats for fourteen passengers, there is a third large baggage compartment.

All-metal construction is used for the cabin section, the skeleton structure being of extruded duralumin sections. Flat stressed skin is employed for the covering. The engine mounting, undercarriage, and main fittings are of chrome molybdenum steel tube, welded and heat treated.

The hatch over the pilot's cockpit, which is located in the leading edge of the "fuselage," is arranged to slide rearward.

Vision, of course, is quite exceptionally good forward, rearward and overhead, and lateral downward view is increased by windows on each side. It is possible also for the pilots to look rearwards through the cabin windows below the wing.

Hydraulic operation is used for landing gear and wing flaps, both items being visible and accessible to the pilot. It is possible to retract the wheels in 45 seconds, and to lower them in 12 seconds. The tail wheel, too, is retractable.

The manufacturers claim that because the outer wing structure is not required to absorb heavy landing shocks, nor to withstand the strain of engine vibration, torque loads, or extraordinary strains in the event of airscrew failure, greater safety is obtained than in the case of more conventional designs. With the engines and airscrews attached to the outer sections of the wings in these designs, they maintain that, in the event of engine failure, single engine operation introduces a large turning moment which must be corrected by forces acting on the vertical tail surfaces, reducing available directional control and creating a potential source of difficulty. In the Burnelli design, with the engines in the nose of the aerofoil fuselage and with the airscrews close together, this undesirable feature is greatly reduced.

Another of their contentions is that the forward location of

These general arrangement drawings of the Burnelli UB-14A show also the passenger seating arrangements. A photograph appears on page 531.

the engines, directly ahead of the passenger compartment, provides valuable protection in the event of nosing over.

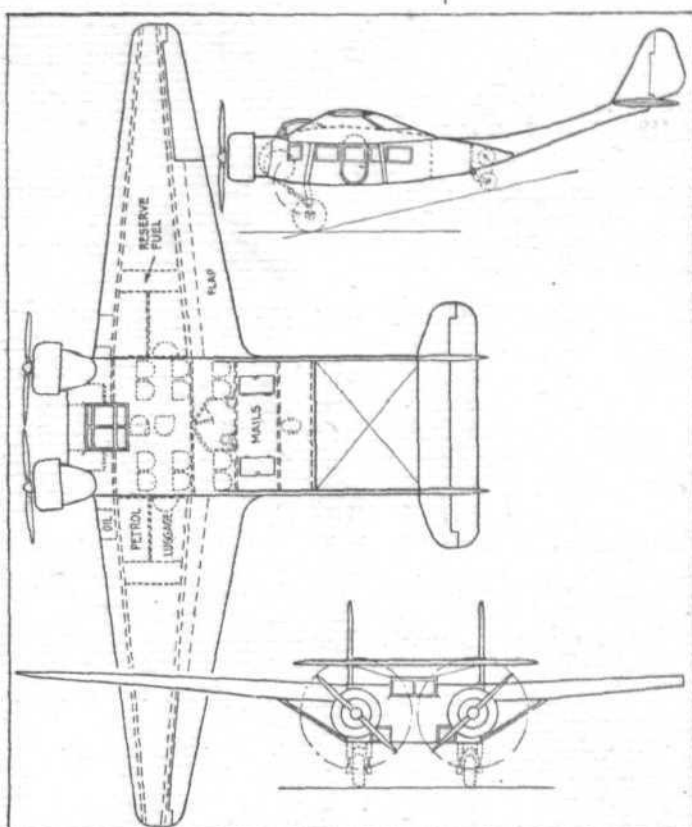
The accessibility of the engines in flight is, of course, a valuable feature. Minor repairs to all fuel, oil and control leads are possible in flight. The retractable undercarriage is not only visible to the pilots, but, in the event of any failure of the operating mechanism, it is accessible for inspection and adjustments. The large cabin space is important for passenger carrying and also permits the stowage of bulky packages. Operators will appreciate that it is often impossible to carry the full payload of a machine, in weight at least, because of the actual bulk of the goods to be transported.

BURNELLI UB-14A

Twin-engine Transport Monoplane

Two Pratt and Whitney Hornet Engines (700 h.p. each)

DIMENSIONS.	
Span...	71 ft.
Length	44 ft.
Height	10 ft.
Total lifting surface	686 sq. ft.
WEIGHTS AND LOADINGS.	
Weight empty	8,000 lb.
Weight loaded	14,000 lb.
Surface loading	20.4 lb./sq. ft.
Power loading	9.65 lb./h.p.
PERFORMANCE.	
Maximum speed at 10,000 ft.	225 m.p.h.
Cruising speed at 10,000 ft.	200 m.p.h.
Maximum speed at sea level	210 m.p.h.
Maximum speed on one engine (7,000 ft.)	150 m.p.h.
Service ceiling	22,000 ft.
Stalling speed	63 m.p.h.
Range at cruising speed	600 miles.



FOR the AERIAL "ARDITI"

The Breda 64, Representing a New Class of Military Aeroplane Now Being Developed in Italy

THE Italian Army is said to have formed squads of picked men—*Arditi* ("dare-devils") they are called—who, with grenades in their hands and daggers in their mouths, would be chosen for particularly dangerous tasks, especially, it is presumed, for surprise attacks by night. Apparently the Italian Air Force is working on somewhat similar lines and, as reported in *Flight* last week, is testing various "assault" machines whose duties would entail attacking targets of every description, fixed and moving, including, in the latter category, other aeroplanes. As an Italian contemporary puts it, the "quintessence of aerial heroism" would be required in the operation of such aircraft.

One machine in this class is the new Breda 64 monoplane. It is a low-wing type with a single Piaggio Stella IX engine or an Alfa-Romeo Pegasus type radial designated the 125 R.C.25. Both these units deliver about 600 h.p. and give a speed in the neighbourhood of 220 m.p.h. With a 900 h.p. engine 267 m.p.h. should be attained, with disposable loads varying from 1,540 lb. to 3,080 lb. according to the

nature of the work for which the machine is used.

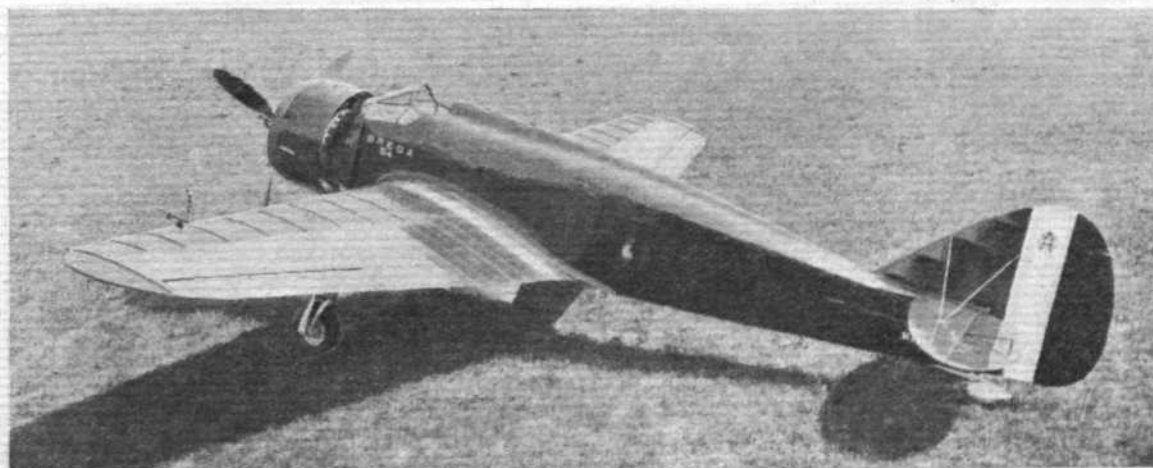
The framework of the cantilever wings is of chrome molybdenum steel tubing, welded and covered partly with duralumin sheeting (on the leading edge, apparently) and partly with fabric. Welded steel tubular construction is employed also for the fuselage, which is metal-covered over its forward portion, the remainder being fabric-covered.

Both hydraulic and mechanical controls are provided for the retractable undercarriage, which is in two separate halves, folding rearward and upward into fairings below the wings.

Main dimensions are: Span 39ft. 7in., length 31ft. 5in., and wing area 247.5 sq. ft. The gross weight is 5,511lb.; the disposable load, as a bomber, 2,425lb.; as a reconnaissance machine, 2,200lb., and as a two-seater fighter, 1,609lb.

With the 600 h.p. engine a cruising speed of 192 m.p.h. is attained. The following figures apply to the machine as a two-seater fighter, reconnaissance machine and bomber in that order: climb to 16,400ft., 14 min., 16 min., 18 min., and ceiling, 25,240ft., 22,960ft. and 22,300ft.

The Breda 64, as shown in this photograph, is fitted with a 600 h.p. Piaggio Stella radial which gives a maximum speed of about 220 m.p.h. With a 900 h.p. engine it does 267 m.p.h. The pilot, it will be agreed, has an exceptionally good outlook. He will probably need it, as well as the "quintessence of aerial heroism" (see text).



THE INDUSTRY

About Instruments : News from Bristol : Demonstrating British Aircraft Abroad

For Investors and Others

"AIRCRAFT and Accessories, 1935," is a useful handbook giving financial and other details of leading firms in the aviation industry. It is published at 2s. 6d. by the Business Statistics Co., Ltd., The Exchange, Cardiff.

Heston to India

MR. RONALD MALCOLM, of Malcolm and Farquharson, Ltd., aircraft agents, of Heston, is at present on his way to India. He will remain there until the end of January, and anyone wishing to get into touch with him may do so at 50, College Road, Shalimar, Howrah, Calcutta.

Instrumental

OF considerable interest intrinsically, apart from its utilitarian aspect, a most informative and well illustrated catalogue of their aircraft and meteorological instruments has just been issued by Short and Mason, Ltd., Aneroid Works, Walthamstow, London, E.17. It is in three languages—English, French and German.

An Appointment

IT is announced that F/O. A. J. Pegg is joining the Bristol Aeroplane Company as a test pilot.

F/O. Pegg, who has been stationed at the Aeroplane and Armament Experimental Establishment, is to assist Capt. C. F. Uwins. In addition to testing all Bristol machines, Capt. Uwins is also chief instructor of the Bristol Flying School, and in view of the much increased output of aircraft by the factory extra help has been found necessary.

A New Trickle Charger

FOR the maintenance of batteries on open circuit or but lightly used, for such purposes as impulse clock operating, energising alarms and bells, and for radio systems, the Exide Company has introduced a new trickle charger for use on single phase A.C. circuits in two models—200-250 volts and 100-120 volts. The charger is assembled in a cellulose "leatheroid" finished stout metal case, measuring 8in. wide by 8½in. long by 6½in. high, and each model is priced at £5 5s.

Busy-ness at Bristol

MR. W. G. VERDON SMITH, C.B.E., Colonel Sydney E. Smith, C.B.E., and Sir G. Stanley White, Bart., who have very large interests in the Bristol Aeroplane Company, which is now working at very high pressure, have decided to relinquish their interests in road passenger transport because of their other business claims. They have therefore retired from the board of directors of the Bristol Tramways and Carriage Co., Ltd., of which Mr. W. G. Verdon Smith was chairman and managing director, and Colonel Sydney E. Smith was general manager.

Living Up to Its Name

MR. R. D. KING, business manager of Airspeed (1934), Ltd., has recently returned from a successful business trip to the Continent. He travelled as far as Berlin in an Airspeed Envoy, but there left the machine, which proceeded to Riga, where several demonstrations had been arranged.

Mr. King went on to visit the Ceskoslovenske Statni Aerolinie of Prague, which, as reported recently in *Flight*, has taken delivery of two Envoys fitted with Walter Castor II engines. These machines have already completed several survey flights between Prague and Moscow in preparation for the opening to passengers and mails of this new service in the spring.

At Riga, the demonstration machine made several flights to the satisfaction of the authorities and officers of the Flying Corps. From Riga it flew home via Lithuania and Estonia, where demonstrations had also been requested. In each country great interest was shown in the performance and luxury fittings. The Envoy returned to Portsmouth Airport, having, it is stated, travelled 2,400 miles without even a suggestion of trouble.

Monospars for the Ministry

IT is announced that the Air Ministry has placed an order with General Aircraft, Ltd., for a small number of S.T.25 Monospars. This order represents the first purchase by the Ministry of twin-engined light aircraft, and it is understood that the machines are to be used for work in connection with blind flying.

An Adaptable Reamer

A FOLDER just issued by the English Steel Corporation, Ltd., Vickers Works, Sheffield, describes a new adjustable reamer which has several interesting features, of which the outstanding one is adaptability. In the reamer body is a set of five parallel blades, which can be set and positively locked by a key, the setting being adjustable to a micrometer graduation.

Such is the extent of interchangeability that eight bodies and six sets of blades will accommodate all English and metric sizes from 1 in. to 1½ in. Five bodies and eight sets of blades cover all sizes from 2½ in. to 3½ in.

The blades are of 22 per cent. tungsten high-speed steel, and tungsten carbide blades can be fitted if required.



AERONAUTICAL PATENT SPECIFICATIONS

(The numbers in brackets are those under which the Specifications will be printed and abridged, etc.)

Published November 14, 1935.

- 21048. MILES, F. G. AND POWIS, C. O.: Brake controls for aircraft (436,680).
- 4074. BRISTOL AEROPLANE CO., LTD., AND GARRETT, W. L.: Method of and means for forming flanges on plugs, bushes, and the like (436,706).
- 6294. SOC. D'INVENTIONS AERONAUTIQUES ET MECANIQUES S.I.A.M.: Propellers for aircraft and the like (436,629).
- 16364. SIEMENS AND HALSKE ART.-GES.: Supercharging arrangements for aircraft motors (436,785).

Published November 21, 1935.

- 12214. COATS, A. G., AND HAPNER, R.: Helicopter and rotating-wing aircraft (437,034).
- 18889. KAY GYROPLANES, LTD., KAY, D., AND DYER, J. W.: Devices for damping the oscillation of the revolving wings or blades of aircraft (436,981).
- 36038. BRISTOL AEROPLANE CO., LTD., AND GARRETT, W. L.: Joining the parts of metal structures (436,997).

NEW COMPANIES

In the notes below, for reasons of space, the "objects" of new companies are usually somewhat abbreviated.

OILSHALE DEVELOPMENT LTD. Registered as a private company on November 4. Nominal capital, £15,000 in £1 shares. Objects: To adopt an agreement with Dr. Max J. Stephan for the acquisition of certain rights; to acquire any patents and the like relating to the extraction of benzene, motor and aviation spirit, etc. By the treatment of coal and other bituminous deposits, and to carry on the business of manufacturers of and dealers in oils, petrol, etc. Directors: Max J. Stephan, 69, Loughborough Place, London, S.W.9; Edward P. Southby, 8, Granville Place, London, S.W.7. Registered office: Salisbury House, Richmond Hill, Bournemouth.

INCREASES OF CAPITAL

REID AND SIGRIST LTD. (Shannon Corner, Kingston By-Pass, New Malden).—The nominal capital has been increased by the addition of £16,000, in £1 ordinary shares, beyond the registered capital of £4,000.

AIRCRAFT INDUSTRIES CORPORATION LTD. (King William Street House, Arthur Street, London, E.C.4).—The nominal capital has been increased by the addition of £149,900 beyond the registered capital of £100. The additional capital is divided into 599,600 ordinary shares of 5s. The directors are Wm. Craven-Ellis, M.P., of 21, Portland Place, W.1; and Wm. A. Phillips, of Mayfair Court, W.1 (director of Yorkshire and Lancashire Corporation Ltd.).

NORTHERN AND SCOTTISH AIRWAYS LTD. (Exchange Buildings, Onayside, Newcastle on Tyne).—The nominal capital has been increased by the addition of £5,000 in £1 ordinary shares, beyond the registered capital of £7,000. The 5,000 new shares and 2,248 unissued shares of the original capital are to be allotted to such persons as United Airways Ltd. might select.

CHANGE OF TITLE.

ALLIED BRITISH AIRWAYS, LTD.—Name changed to British Airways, Ltd., on October 29, 1935. This is a private company, registered on September 30, 1935, with a nominal capital of £100 in 100 shares of £1 each. The directors are: Wm. D. L. Roberts, M.L.C.E., Harold H. Balfour, John de C. Ballardie, John R. McCrindle, Edgar L. Granville, and Gerard d'Erlanger.

BURTONWOOD MOTOR AND ENGINEERING COMPANY LTD., Collins Green, Warrington.—Name changed to Burtonwood Motor and Aircraft Engineering Company Limited, on November 6, 1935.

PUBLICATIONS, ETC., RECEIVED

Practical Air Navigation. By Wing Commr. J. K. Summers. Price 2s. 6d. Sir Isaac Pitman and Sons, Parker Street, Kingsway, London, W.C.2.

Aeronautical Research Committee Report for the Year 1934-35. Price 1s. 6d. H.M. Stationery Office, Kingsway, London, W.C.2.

Air Publication 1401: Regulations for University Air Squadrons. Price 4d. H.M. Stationery Office, Kingsway, London, W.C.2.

"On Every Desk" memo, pad. Price 5s. upwards. W. H. Colt (London) Ltd., Bush House, London, W.C.2.

The Young Airman's Diary. Price 1s. (Is. 2d. by post). Letts Quirk & Diaries Ltd., 160, Shaftesbury Avenue, London, W.C.2.